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Practice Locations of Family Practice Residency Graduates

Gordon Schmittling, Ross R. Black, M.D., Thomas L. Stern, M.D., and Claudene Clinton

Abstract—The purpose of this study was to examine the practice location patterns of 1970–1978 graduates of family practice residency programs. Comparisons were made between the number of graduates practicing in a region in 1979 with the number of all graduates during 1970–1978 from family practice residency programs in that region and with the number of all graduates from medical schools in that region who eventually completed family practice residencies elsewhere. The Middle Atlantic and West North Central regions showed marked decreases, while the Mountain, Pacific, and New England regions showed increases. The majority practiced more than 100 miles from their residency program. Most respondents practicing in a nonmetropolitan area moved outside of a 100-mile radius from their residencies. Most respondents practicing in a metropolitan area practiced within the 100-mile radius. Physicians were likely to be practicing in a community similar to their backgrounds.

The inaccessibility of health care in nonurban and inner-city areas was recognized as a major health care problem in the United States two decades ago. Three different study groups, representing the public (1), organized medicine (2), and the government (3), concluded that specialty maldistribution was a contributing factor and recommended increasing the number of physicians to deliver primary care.

In 1969 the American Board of Family Practice (ABFP) was established. Fifteen family practice residency programs were accredited in that first year. The number of programs was 382 in 1980. The number of first-year positions has grown from fewer than 50 to more than 2,500, according to unpublished data from annual surveys of family practice residency programs conducted by the American Academy of Family Physicians (AAFP). This growth would not have been possible without federal and state funding. Numerous federal and state legislators believed that these newly trained specialists would provide cost effective, comprehensive personal health care and would practice in geographic areas of need. Federal appropriations grew from $5 million in fiscal 1972 under the Health Manpower Training Act of 1971 to $50 million in fiscal 1980 under the Health Professions Educational Assistance Act. State appropriations have likewise increased year by year as individual states have made large commitments to

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Mr. Schmittling is the manager of data collection and analysis, Dr. Black is the assistant director of the Division of Education, Dr. Stern is the vice-president for education and scientific affairs, and Mrs. Clinton is the director of the Division of Research and Information Resources. All work for the American Academy of Family Physicians, Kansas City, Missouri.

the training of family physicians. Some states have based future appropriations to residencies upon the willingness of graduates to practice in locations with physician manpower shortages.

Method

In 1979 the American Academy of Family Physicians initiated a study of all graduates of family practice residencies for the purpose of tracking these physicians between the time of graduation and the current practice location. Since the names and addresses of all graduates of family practice residencies were not available, the study was limited to include only graduates of family practice residency programs between 1970 and 1978 who were diplomates of the ABFP. The survey was mailed in the summer of 1979 to this target population of 4,295 physicians based in the United States; 3,302 physicians returned the questionnaires for an effective response rate of 76.9 percent. By census region, response rates varied from 83.5 percent for the Mountain region to 71.1 percent for the Middle Atlantic states.

Of the 3,302 physicians responding, there were 281 physicians whose current practice was limited to emergency medicine, military assignment, or public health service or who were in further training in family practice or another medical specialty, part-time practice only, or no current practice activity. Because the practices of these 281 physicians differed markedly from the practices of the remaining 3,021 respondents, they were excluded from the study.

Demographic, medical education, and practice characteristics as well as hospital admission/practice privileges of the respondents are available in an earlier publication reporting results of this study (4).

Results

The distribution of these graduates compared with the distribution of the U.S. population was skewed toward the nonmetropolitan areas. While the U.S. population was distributed as 73.3 percent in a Standard Metropolitan Statistical Area (SMSA)* and 26.7 percent in a non-SMSA according to 1977 data, the respondents in this study were distributed as 59.6 percent in a SMSA and 37.4 percent in a non-SMSA (Table 1).

Comparisons of the percentage of respondents in each region practicing in nonmetropolitan areas reveal marked differences; however, when reviewed in relationship to the percentage of the population in each region living in nonmetropolitan areas, the differences are easily understood. Two regions are worthy of note: while 13.7 percent of the general population in the Pacific division live in a rural area, 27.0 percent of the respondents practice there; while 39.5 percent of the general population in the Mountain division live in a rural area, 51.6 percent of the respondents practice there. (Comparisons of SMSA and non-SMSA areas in the New England census division are inappropriate as respondents were placed in their county of practice whereas SMSA designations in New England are based upon towns and cities as the primary unit.)

REGIONAL COMPARISONS

The comparisons of region of medical school, region of family practice residency program, and region of current practice of the respondents as of 1979 provide some insights into how the graduates moved through their training and into practice (Table 2). However, analysis of any apparent shifts in the population under study should be tempered by two caveats.

Comparing the number of graduates

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* An SMSA is defined in general as having either (*a*) one city of 50,000 or more inhabitants or (*b*) one city with at least 25,000 inhabitants, which, when combined with contiguous places having a density of 1,000 or more people per square mile, will have a population of at least 50,000.

TABLE 1

Distribution of 1970–1978 Family Practice Residency Graduates by Region and Location of 1979 Practice in a SMSA or Non-SMSA

Region of Practice	Total		Location of Practice						Percentage of U.S. Population in Non-SMSA (July 1977)†
			SMSA		Non-SMSA		Not Reported		
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
New England*	136	100.0	54	39.7	82	60.3	0	0.0	18.0
Middle Atlantic	336	100.0	264	78.6	69	20.5	3	0.9	13.4
East North Central	534	100.0	335	62.7	173	32.4	26	4.9	23.2
West North Central	394	100.0	162	41.1	219	55.6	13	3.3	48.5
South Atlantic	509	100.0	314	61.7	181	35.6	14	2.8	34.0
East South Central	123	100.0	61	49.6	60	48.8	2	1.6	48.0
West South Central	216	100.0	131	60.6	75	34.7	10	4.6	30.6
Mountain	248	100.0	114	46.0	128	51.6	6	2.4	39.5
Pacific	525	100.0	365	69.5	142	27.0	18	3.4	13.7
Total	3,021	100.0	1,800	59.6	1,129	37.4	92	3.0	26.7

* Care should be used in comparing SMSA versus non-SMSA in New England, since SMSAs are defined usi[illegible]e town as the primary unit rather than the county.

† [illegible]*nates of the Population of Counties and Metropolitan Areas: July 1, 1976 and 1977.* Current Population Repor[illegible] Series P-25, No. 810. Washington, D.C.: U.S. Government Printing Office, 1979.

from medical schools in one region with the number of graduates from another region is not possible since the number of medical schools in each region (and thus the number of graduates) vary greatly. This same premise applies to making comparisons among regions with respect to the number of graduates of family practice residency programs produced by each region.

The second caveat that should be considered when viewing these data pertains to the retention rate for each region. In Table 2 no attempt has been made to show which graduates stayed in a region for part of or all of their years in medical education; that is, the 95 respondents who graduated from medical school in the New England census region are not necessarily some of the same 69 respondents who graduated from residency programs in New England.

The data in Table 2, however, prove very useful in examining the shifting patterns of location as respondents move into practice. In two census regions, the Middle Atlantic and the West North Central regions, more family physicians were trained in the regions than were staying in the respective regions to practice.

In the Middle Atlantic census region there was a 42.4 percent decrease in the number of respondents practicing in the region compared with the number who graduated from a medical school there and a 26.5 percent decrease in the number of respondents who practice in the region compared with the number who completed a family practice residency in that region. Similar statistics are reported for the West North Central region, where there was a 26.9 percent decrease in the number practicing in the region compared with the number who attended medical school in the region and a 10.9 percent decrease compared with the number who completed a family practice residency program there.

Three regions showed remarkable increases in the number of newly trained family physicians compared with the number who actually trained in those regions. In the Mountain region there was a 134.0 percent increase in the number of respondents practicing in the region compared with the number who went to medical school in the region and a 66.4 percent

TABLE 2

Distribution of 1970–1978 Family Practice Residency Graduates by Region of Medical School, Family Practice Residency Program, and 1979 Practice

Region	Region of Medical School	Region of Residency Program	Region of Practice	Percentage Change, Region of Medical School to Region of Practice	Percentage Change, Region of Residency to Region of Practice
New England	95	69	136	+43.2	+97.0
Middle Atlantic	583	457	336	−42.4	−26.5
East North Central	405	554	534	+31.9	−3.6
West North Central	539	442	394	−26.9	−10.9
South Atlantic	442	584	509	+15.2	−12.8
East South Central	154	87	123	−20.1	+41.4
West South Central	222	193	216	−2.7	+11.9
Mountain	106	149	248	+134.0	+66.4
Pacific	279	474	525	+88.2	+10.8
Foreign or not reported	196	12			

increase compared with the number who completed a family practice residency in the region. Similar statements can be made about the respondents in the Pacific and New England regions. In the Pacific region, there was an 88.2 percent increase in comparing region of current practice with region of medical school and a 10.8 percent increase in comparing region of current practice with region of residency program. In the New England region, there was a 43.2 percent increase in comparing region of current practice with region of medical school and a 97.0 percent increase in comparing region of current practice with region of residency program.

Perhaps the percentage declines in two regions and the percentage increases of two of the three regions mentioned above can be explained by the overall population changes in the United States. The Middle Atlantic and West North Central census regions, which experienced declines in comparing regions of practices with region of medical education, experienced two of the lowest rates of population growth among all census divisions between 1970 and 1979 (−1.5 percent and 4.4 percent respectively), according to U.S. Census Bureau statistics. The Mountain and Pacific census regions, however, which experienced increases in comparing region of practice with region of medical education, experienced two of the highest rates of population growth between 1970 and 1979 (27.5 percent and 13.4 percent respectively). Thus, it would appear that graduates located their practices in a manner correlated with the shifts in general population, as they search for areas or population centers that will support a practice. The generalization is not an absolute, though, as the New England census division experienced only a modest 3.3 percent population increase between 1970 and 1979.

STATE COMPARISONS

Comparisons of regions of current practice, residency program, or medical school are not as important to state or local governments as are the comparisons of the states of current practice, residency program, or medical school (Figure 1). A comparison of state of residency program and state of medical school shows that 52.6 percent of the respondents changed states between undergraduate and graduate medical education, 40.7 percent took their graduate medical education in the same state as their undergraduate medical education, and 6.4 percent attended a foreign medical school.

The number of respondents practicing in the same state in which they graduated from medical school was almost equal to

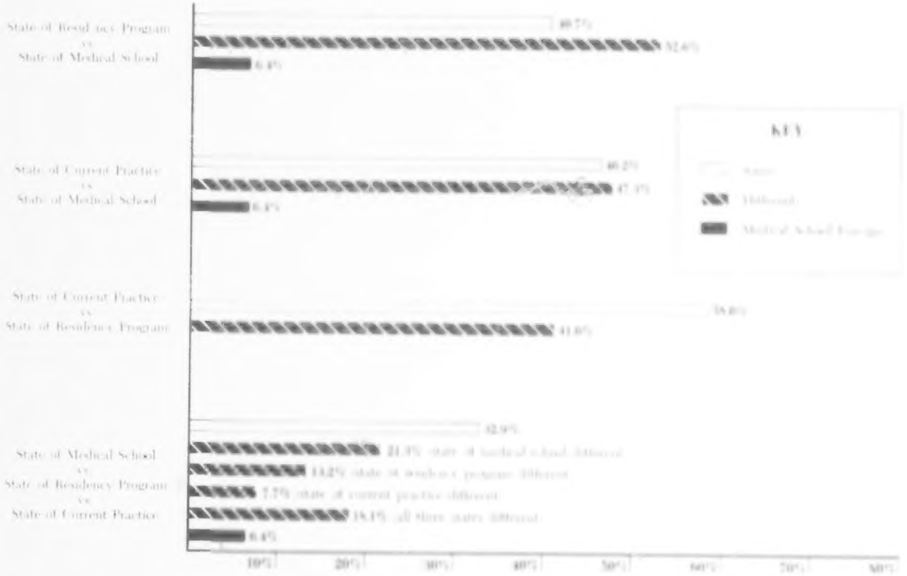

FIGURE 1

Comparisons of states of medical school, family practice residency program, and current (1979) practice of 1970–1978 family practice residency graduates.

the number not practicing in the same state (46.2 percent and 47.3 percent respectively). These data are consistent with data from other studies that have shown a decreasing trend for physicians to practice in the same state as the state of their undergraduate medical education (5, 6).

Respondents who graduated from publicly funded medical schools were more likely to practice in the states of their medical schools than were respondents who graduated from private schools. Of the 2,077 respondents who graduated from a publicly funded medical school, 57.3 percent practiced in the same state as the state of the medical school; of the 689 who graduated from a private medical school, 27.1 percent practiced in the same state as the state of the medical school. This trend has been noted in other studies as well (7).

In comparing state of practice with state of residency training, it is shown in Figure 1 that 58.6 percent of the respondents practiced in the same state in which they completed a residency program and 41.0 percent did not. Individual state statistics were not examined, because it was not possible to determine the effects of non-response upon these percentages. However, some state studies have been performed which can provide these data (8, 9).

A comparison of the states of all three contacts of the respondents to the survey indicates that one in three respondents (32.9 percent) practiced in the same state in which he took both undergraduate and graduate medical education. One in five (21.3 percent) practiced in the same state as his graduate medical education, although undergraduate medical education was taken in another state. One in 10 respondents (13.2 percent) practiced in the same state as the state of undergraduate medical education, although the state of graduate medical education was different. Only 7.7 percent of the respondents practiced in a state different from the state of graduate and undergraduate medical education, both of which were in the same state, and 18.1 percent had all three states of contact different.

PRACTICE AND RESIDENCY

Several authors have suggested that most residents tend to select a practice site within 100 miles of the community in which the residency is located (8, 10). Based upon this generalization, funding for several family practice residencies and satellites have been provided for communities with the purpose of placing graduates within a close radius of that community.

In the present study, however, the authors found that 52.3 percent of the respondents practiced outside a 100-mile radius from the residency program from which they graduated and 47.6 percent practiced within a 100-mile radius. (The reader is cautioned that these percentages are based on national statistics and should not be interpreted as state results.) Before these statistics form the basis of a new generalization, there are two factors which should be examined.

The statement that 52.3 percent of the respondents practiced outside a 100-mile radius from the residency program is understandable when viewed in the context of how many respondents practiced in a state different from the state of their residency program. As previously indicated 41.0 percent of the respondents, or 1,238 physicians, practiced in a state different from the state in which they completed a family practice residency. Of these 1,238 respondents, 93.8 percent reported that not only were they practicing in a different state from the state of their residency but also they were practicing more than 100 miles from that residency. Only 6.1 percent of these respondents, or 75 respondents, reported that they were practicing in a different state from the state of their residency but still within a 100-mile radius of their residency. Of the 1,769 respondents (58.6 percent) who were practicing in the same state as the state of their residency, 76.8 percent practiced within a 100-mile radius of their residency and 23.0 percent practiced outside the 100-mile radius.

It is also important to understand that most family practice residency programs are located in metropolitan areas because of the resources these areas provide to the residencies; 88.4 percent of the residencies in 1979 were located in an SMSA. Of the 1,129 respondents practicing in a non-SMSA, 72.5 percent were practicing more than 100 miles from the residency program. Of the 1,800 respondents practicing in SMSAs, 60.2 percent practiced within 100 miles of their residencies. Thus, because most residencies are located in urban settings, respondents who wish to practice in rural settings probably move more than 100 miles from their residencies to find a rural setting, whereas most residents who remain within an urban setting practice within a 100-mile radius from their residency.

COMMUNITY SIZES

In order to compare the size of the community of practice with the physician's hometown, a detailed, subjective listing of categories was used for community size. The findings, supported by other studies on physician practice location (11, 12), indicate that family physicians tend to practice in communities related to their background (Table 3). Physicians from a rural background were twice as likely to practice in a rural area than were physicians from nonrural backgrounds. Physicians from a large metropolitan background were three times as likely to practice in a large metropolitan area than were physicians from another background. The plurality of physicians from each back-

TABLE 3

Distribution of 1970–1978 Family Practice Residency Graduates by Size of Home Community* and Size of 1979 Practice Location

Character/Population of Home Community	No.	Percentage Practicing in Rural	Small Town	Large City	Small Metropolitan Area	Large Metropolitan Area
Rural (<2,500)	547	20.1	43.3	16.5	11.7	8.4
Small town (2,500–25,000)	846	6.7	57.0	13.4	11.1	11.8
Large city (25,000–100,000)	404	6.2	29.0	36.6	13.9	14.4
Small metropolitan area (100,000–500,000)	383	7.3	29.8	16.4	35.5	11.0
Large metropolitan area (>500,000)	824	10.4	31.3	13.5	11.8	33.0
Total	3,004†	10.2	40.2	17.5	14.9	17.2

* Size of community in which physician spent school years prior to graduation from high school.

† There were 17 respondents who did not reply to the questions.

ground practiced in a community similar to their background. The most popular practice sites of respondents (40.2 percent) were in towns with populations of 2,500 to 25,000.

Discussion and Conclusions

The results of this study are not directly comparable with other studies on physician mobility. Most studies on physician mobility follow a cohort 15 years after graduation from medical school. This study not only combined all physicians who completed a family practice residency between 1970 and 1978 into one group but also examined current practice location for many physicians only seven years out of medical school. Because family practice residents have graduated in significant numbers only recently, a mobility study of family practice residents comparable with other physician mobility studies cannot yet be performed.

The data reported here do provide some indication of how respondents have moved through their medical education and into practice. The results of this study are:

1. More than one in three respondents was practicing in a non-SMSA.

2. In the Middle Atlantic and West North Central census regions, there was a marked decrease in the number of respondents who practiced in both regions compared with the number who graduated from medical school or from a family practice residency in their respective regions. In the Mountain, Pacific, and New England census divisions, there was a marked increase in the number of respondents who practiced in each of the regions compared with the number of respondents who graduated from medical school or a family practice residency in their respective regions. The movement of the respondents to their eventual practice locations is somewhat comparable with the mobility patterns of the U.S. population for four of the five census regions during the last decade.

3. The more contact a physician has with a state, the more likely he is to practice within that state. Points of contact examined in this study include state of medical education and state of family practice residency program, with the latter contact having a greater influence.

4. The majority of respondents practiced more than 100 miles from their residency program. This statistic is understandable when viewed in the context of the number of respondents who were prac-

ticing in a state different from the state of their family practice residency program (41.0 percent) and thus moved more than 100 miles from their residency program.

5. Most respondents practicing in a non-SMSA had moved outside a 100-mile radius from their family practice residency programs. Most respondents practicing in an SMSA were practicing within the 100-mile radius of their residency programs.

6. Physicians were likely to be practicing in a community similar to their backgrounds, that is, where they spent their years prior to high school.

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DATAGRAM

Analysis of University-Owned Teaching Hospitals' Income

The Department of Teaching Hospitals of the Association of American Medical Colleges (AAMC) has for the past decade conducted an annual survey of financial and general operating data for the university-owned members of the Council of Teaching Hospitals (COTH). In April 1980 questionnaires for the survey of fiscal 1979 data were mailed to 63 hospitals. By December a 100-percent response rate was achieved for the second consecutive year. The fiscal 1979 survey questions were selected to enhance continuity and comparability with previous survey years; data pertaining to operating income are reported on an accrual basis.

Hospitals Receiving State Funds

Forty-four (nearly 70 percent) of the teaching hospitals reported state appropriations as a source of operating revenue during fiscal 1979. This was three more hospitals than the number reporting such appropriations in the previous survey year. State funds to the 44 hospitals totaled $483.6 million, or 17.1 percent of the hospitals' total operating incomes (Table 1). This percentage continues to show a "leveling off" that has been occurring over the last three survey years. The fiscal 1977 and 1978 percentages were 17.3 and 17.6 respectively. Prior to this period, the state portion, which had been the largest source of operating income for these hospitals, was shrinking significantly each year (from 27.8 percent in fiscal 1971 to 19.2 percent in fiscal 1976). At the same time, Medicare's portion of the total operating incomes of recipients of state funds continually grew (from 11.4 percent in fiscal 1971 to a high of 21.7 percent in fiscal 1979) and assumed the position as leading source of income in fiscal 1976 (and has held it since). Among those sources whose contribution to total operating income diminished during fiscal 1979 were commercial insurance, self-pay patients, and additional welfare payments. These decreases were offset by increased operating income from Blue Cross, Medicare, Medicaid, and "other" income (that is, income from workman's compensation, overhead from sponsored programs, government contracts for patient care, and miscellaneous sources).

The actual dollar amounts of individual state appropriations in fiscal 1979 ranged from $1.1 million to $39.8 million. As shown in Table 2, 26 (59 percent) of the 44 institutions relied on state appropriations for between 1 to 20 percent of their total operating incomes; 13 (30 percent)

TABLE 1

Sources of Income of University-Owned Teaching Hospitals Receiving State Appropriations

(In thousands of dollars)

Income Source	Fiscal 1979 (N = 44)		Fiscal 1978 (N = 41)		Fiscal 1977 (N = 41)	
	Amount	Percent	Amount	Percent	Amount	Percent
State appropriations	483,632	17.1	412 179	17.6	342,651	17.3
Blue Cross	385,429	13.6	308,761	13.2	278,141	14.1
Commercial insurance	470,284	16.7	396,610	17.0	357,760	18.1
Self-pay	176,854	6.3	180,467	7.7	122,850	6.2
Medicare	611,283	21.7	487,256	20.9	399,347	20.2
Medicaid	427,423	15.2	347,417	14.9	276,579	14.0
County appropriations	25,399	.9	19,465	.8	14,938	.8
City appropriations	4,175	.1	6,928	.3	12,663	.6
Additional welfare payments	20,161	.7	27,250	1.2	19,335	1.0
Other	215,783	7.7	149,656	6.4	152,511	7.7
Total	2,820,423	100.0	2,335,989	100.0	1,976,775	100.0

of these hospitals received 21 to 40 percent of their incomes from state funds; and the remaining five state-supported hospitals received 41 to 60 percent of their incomes from this source. Three hospitals were in this latter category in fiscal 1978. The mean state appropriation among the 44 respondents was $11.0 million in fiscal 1979, compared with $10.1 million in fiscal 1978. The mean total operating income of these teaching hospitals in fiscal 1979 was $64.2 million, up from $57.0 million in fiscal 1978. Clearly, the rate of increase (17.3 percent) in total state appropriated dollars did not keep pace with the rate of dollar growth (20.7 percent) in the total operating income of these state-supported hospitals.

Hospitals Not Receiving State Funds

Table 3 presents aggregate data on the sources of income for the university-owned teaching hospitals that indicated they were not recipients of state appropriations in fiscal years 1977–1979. In fiscal 1979, 19 respondents were in this category. As with their state-assisted counterparts, these hospitals also received the largest portion (27.0 percent) of their operating incomes from Medicare (up 1.1 percentage points

TABLE 2

Distribution of State-Funded Teaching Hospitals by Proportion of Total Operating Income Received from State Appropriations, 1970 Through 1979*

Year	Percentage Total Operating Income from State Appropriations			
	1-20 percent	21-40 percent	41-60 percent	61-100 percent
1979 (N = 44)	26	13	5	—
1978 (N = 41)	25	13	3	—
1977 (N = 41)	25	13	2	1
1976 (N = 40)	24	13	3	—
1975 (N = 38)	19	13	6	—
1974 (N = 30)	13	12	5	—
1973 (N = 28)	13	9	6	—
1972 (N = 34)	12	12	9	1
1971 (N = 34)	11	15	5	3†
1970 (N = 30)	12	8	10	—

* Reported on a cash basis from 1970 to 1973 and on an accrual basis thereafter.

† One hospital in its first year of operation received 100 percent of its operating income from state appropriations.

TABLE 3

Sources of Income of University-Owned Teaching Hospitals Not Receiving State Appropriations (In thousands of dollars)

Income Source	Fiscal 1979 (N = 19)		Fiscal 1978 (N = 22)		Fiscal 1977 (N = 21)	
	Amount	Percent	Amount	Percent	Amount	Percent
Blue Cross	297,380	18.9	329,509	21.2	291,950	22.8
Commercial insurance	232,864	14.8	261,081	16.8	209,354	16.4
Self-pay	189,388	12.1	190,654	12.3	159,557	12.5
Medicare	424,820	27.0	401,744	25.9	334,245	26.1
Medicaid	270,534	17.2	268,464	17.3	215,460	16.8
County appropriations	557	<.1	507	<.1	164	<.1
City appropriations	222	<.1	131	<.1	135	<.1
Additional welfare payments	7,556	.5	10,457	.7	6,476	.5
Other	147,441	9.4	87,801	5.6	61,847	4.8
Total	1,570,762	100.0	1,550,348	100.0	1,279,188	100.0

TABLE 4

Sources of Income by Type of Care in University-Owned Teaching Hospitals*
(In thousands of dollars)

Income Source	Fiscal 1979 (N = 58)				Fiscal 1978 (N = 58)			
	Outpatient		Inpatient		Outpatient		Inpatient	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Blue Cross	54,593	10.6	621,168	19.2	57,724	12.8	574,578	20.3
Commercial insurance	74,088	14.4	587,156	18.1	61,319	13.6	521,375	18.4
Self-pay	116,769	22.8	243,268	7.5	108,604	24.0	272,057	8.9
Medicare	91,562	17.9	929,361	28.7	77,146	17.1	785,921	27.7
Medicaid	95,942	18.7	581,359	17.9	79,353	17.6	510,483	18.0
State appropriations	24,072	4.7	67,151	2.1	21,827	4.8	64,301	2.3
County appropriations	1,395	.3	5,159	.2	838	.2	5,384	.2
City appropriations	3,300	.6	160	<.1	7,056	1.6	0	0
Additional welfare payments	3,168	.6	23,009	.7	6,077	1.3	31,630	1.1
Other	47,993	9.4	181,834	5.6	31,818	7.0	89,717	3.1
Total	512,882	100.0	3,239,625	100.0	451,762	100.0	2,835,446	100.0

* Data reported only for those hospitals able to separate income into inpatient and outpatient categories.

from the previous fiscal year). The only other source of income to experience an increase over its fiscal 1978 contribution to total operating income was the "other" category, which at 9.4 percent of total income was 3.8 percentage points higher than its fiscal 1978 portion. The increased revenue from Medicare and the "other" income category offset decreases from Blue Cross (down 2.3 percentage points) and commercial insurance (down 2.0 percentage points). The mean total operating income in fiscal 1979 for university-owned teaching hospitals that did not receive state funds was $82.7 million, up 17.3 percent from the previous fiscal year's figure of $70.5 million.

Sources of Income By Type of Care

Table 4 compares the fiscal 1978 and 1979 sources of income for the 58 survey respondents that reported revenue data on both inpatient and outpatient bases. On the outpatient side, "self-pay" revenue again provided the highest percentage (22.8 percent) to total operating income in fiscal 1979 despite slipping 1.2 percentage points from its fiscal 1978 portion. The percentage outpatient contribution from Medicaid (18.7 percent) was next highest, with Medicare third (17.9 percent). Year-to-year reductions in outpatient revenue from self-pay patients, Blue Cross (down 2.2 percentage points), city appropriations, and additional welfare payments were offset by increased revenue from Medicaid and Medicare, as well as from commercial insurance and "other" income (up 2.4 percentage points).

On the inpatient side, Medicare was the leading source of revenue again at 28.7 percent of aggregate inpatient income for the 58 teaching hospitals in fiscal 1979. Repeating as second and third leading sources were Blue Cross at 19.2 percent and commercial insurance at 18.1 percent, with Medicaid close behind at 17.9 percent. Increased percentage contributions from Medicare and "other" income (up 2.5 percentage points) offset varying decreases in the inpatient share from all other sources of revenue between fiscal 1978 and 1979.

The mean outpatient income for the 58 repondents in fiscal 1979 was $8.8 million, up an average of $1 million from the previous fiscal year. The mean inpatient income for these institutions was $55.9 million in fiscal 1979, an average increase of $7 million over the fiscal 1978 mean operating income.

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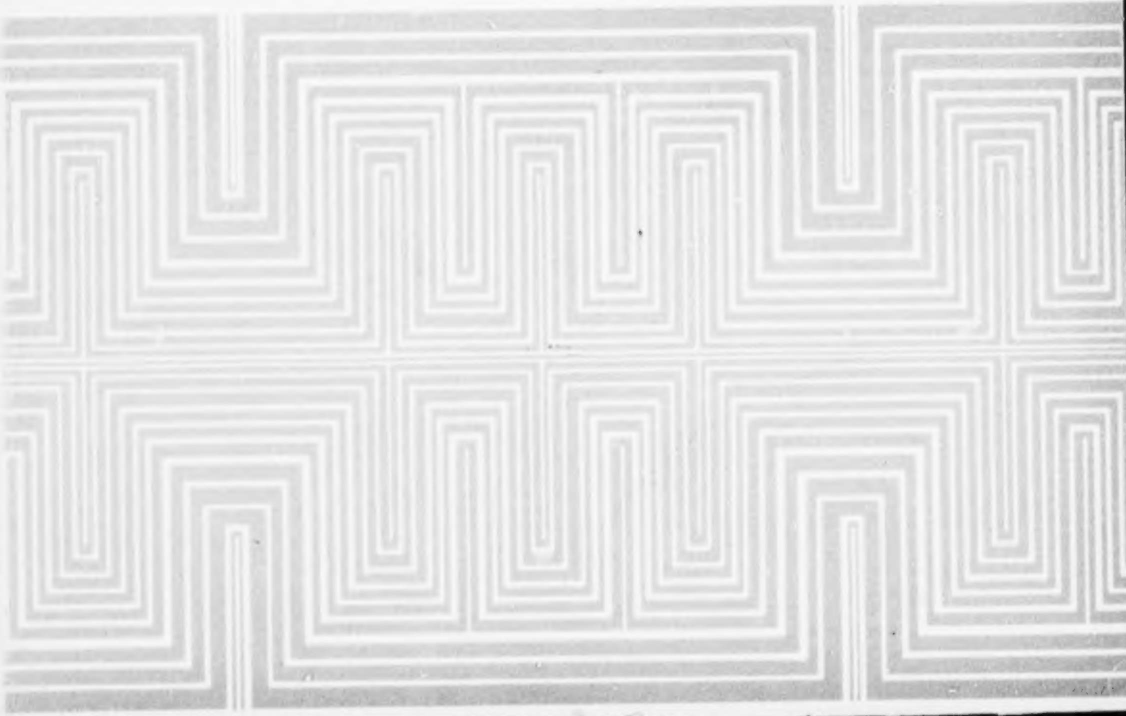
Graduate Medical Education:
Proposals for the eighties



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Introduction

In the past two decades, graduate medical education has become a major activity of medical schools and their associated teaching hospitals. In 1977 over 70 percent of all residents were in graduate programs sponsored by the 323 nonfederal members of the Council of Teaching Hospitals of the Association of American Medical Colleges. According to estimates by the National Resident Matching Program, in 1979–80 more than 95 percent of all residents were in programs having some association with a medical school. In the 1980s over 16,000 students will graduate annually from the 126 medical schools accredited by the Liaison Committee on Medical Education. The vast majority will spend three to seven years as residents in graduate education. Increasingly, the faculties responsible for the undergraduate phase of medical education are responsible for the graduate phase as well.

For these reasons, the Association of American Medical Colleges (AAMC) launched a major effort in 1977 to reappraise the problems and issues confronting graduate medical education. The AAMC Task Force on Graduate Medical Education, appointed to lead this undertaking, identified five areas of special concern that it felt most needed to be studied: the quality of graduate medical education; the transition between undergraduate and graduate medical education; national standards formulation and accreditation; specialty distribution and graduate medical education; and the financing of graduate medical education.

The task force was headed by Jack D. Myers, M.D., University Professor (Medicine) of the University of Pittsburgh School of Medicine. August G. Swanson, M.D., director of the AAMC's Department of Academic Affairs, served as project director. Working groups were named to explore and report on each of the five issues. Chairing these five study groups were the following:

1. Dr. Samuel B. Guze, president of the Medical Center, vice chancellor for medical affairs, and professor and chairman, Department of Psychiatry, Washington University—chairman, Working Group on the Quality of Graduate Medical Education.
2. Dr. D. Kay Clawson, dean, University of Kentucky College of Medicine—chairman, Working Group on the Transition Between Undergraduate and Graduate Medical Education.
3. Dr. Gordon W. Douglas, professor and chairman, Department of Obstetrics and Gynecology, New York University School of Medicine—chairman, Working Group on National Standards Formulation and Accreditation.
4. Dr. Theodore Cooper, dean, Cornell University Medical College and provost for medical affairs, Cornell University—chairman, Working Group on Specialty Distribution and Graduate Medical Education.
5. Dr. Edward J. Stemmler, dean, University of Pennsylvania School of Medicine—chairman, Working Group on the Financing of Graduate Medical Education.

In all, over 70 key individuals involved in graduate medical education were active in the Task Force on Graduate Medical Education and its five working groups.

The task force held its first meeting on June 13 and 14, 1977. In November 1978 it adopted the report of the Working Group on Transition—the first to have been appointed—and by November 29 and 30, 1979, when it last met, the task force had adopted reports of the other four working groups. Over the duration of the project, the task force held nine two-day meetings, and the five working groups met on 13 occasions. During the course of the deliberations, some of the changes recommended in the chapters on transition and on accreditation were evolving or being implemented. Most notable among these was the revision of the policies and practices for the accreditation of graduate medical education, described in Appendix 1.

Throughout the development of the task force's report, communication with others concerned with graduate medical education was encouraged. To facilitate information exchange, observer-participants from the Veterans Administration and from the Graduate Medical Education National Advisory Committee were named to the task force. Additionally, constituents of the AAMC and residents were engaged in forums where the draft reports were examined.

In 1979 the AAMC Executive Council decided to sponsor periodic meetings for residents to gain their perspectives on issues in graduate medical education. From a list of nominees provided by the deans of the medical schools and the Organization of Student Representatives, 32 residents were selected to attend the first conference. The residents reviewed the preliminary draft of the task force's report during that conference, held in October 1979. Their discussion and critique of the document provided useful insights which the task force used.

At the 1979 AAMC Annual Meeting, a representative of each working group presented the major findings and recommendations contained in each chapter to a special Assembly session. The responses from members of the Assembly were largely supportive, although concerns were expressed regarding several issues. One was how the relative autonomy of many major teaching hospitals was to be recognized in defining a medical school and its network of teaching hospitals as an academic medical center. Another was whether the recommendation that academic centers should attempt to adjust the mix of specialists trained in their institutions to meet perceived local, state, regional, or national needs could be accomplished locally by the centers. A third issue was how to resolve the debate over the balance between education and service in graduate medical education programs.

Subsequent to the Assembly discussion, the task force modified the report to deal with concerns that were expressed and presented it to the Executive Council. The Executive Council endorsed the report and decided to disseminate it widely as a working document for discussions by key individuals involved in national graduate medical education policy.

To further stimulate discussions of the report, the Executive Council sponsored an invitational conference on graduate medical education in Washington, D.C., September 29 and 30, 1980. Conference participants were drawn from the medical specialty boards, residency review committees, medical specialty colleges, academics and professorial societies, the Coordinating Council on Medical Education, and the Liaison Committee on Graduate Medical Education. Fifteen private organizations concerned broadly with these issues sent delegates. Those attending the conference are listed in Appendix 14.

Written reactions to the document distributed for discussion at the conference were invited. Commentaries and critiques received were published in the conference agenda and distributed to participants prior to the conference. During the first day of the conference, 30 small group discussions were conducted to permit every voice to be heard. The second day was devoted to a plenary session where summaries of the small group sessions were presented and discussed.

Graduate Medical Education: Proposals for the Eighties, the work that follows, presents the views and recommendations of the AAMC Task Force on Graduate Medical Education and its five working groups. Throughout the chapters, their recommendations appear in italics. The order in which the recommendations fall in no way relates to the order of their importance. Observations and conclusions articulated by those who participated in the AAMC Conference on Graduate Medical Education are included. Editorial changes have been incorporated without note. More extensive offerings appear in parentheses within the text, as new or modified recommendations, or as discrete sections at the end of the chapter.

Implementing the recommendations and achieving the goals set forth in this report will require a commitment from the constituent institutions and organizations that comprise the Association of American Medical Colleges to become actively involved in the continued development and improvement of graduate medical education in the United States. This commitment must be focused on ensuring that residents have the best possible opportunity to achieve the knowledge and skills required to become excellent physicians. Accomplishing this will require a willingness to accommodate their educational needs and to adapt to new relationships and new policies. The AAMC invites the participation of all who are concerned with advancing graduate medical education to join in this enterprise.

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Chapter 1

The Evolution of Graduate Medical Education In the United States

Graduate medical education is the phase of formal medical education that begins at graduation from medical school and ends after the educational requirements for one of the medical specialty certifying boards have been completed. The length of graduate medical education varies from three to seven years. The term "residency" is commonly used to describe the period of graduate medical education, and the term "resident physician" or, more simply, "resident" to identify the physician engaged in such education. The term "resident" derives from the era when physicians being educated and trained for a specialty were expected to reside in the hospital, essentially on a full-time basis. Although few residents now reside full time in teaching hospitals, the name distinguishes this unique group of physicians and is used throughout this report.

As an additional point of clarification, the license to practice medicine is vested in the states. Once licensed, physicians—without specialty training and/or board certification—can limit their practices to specified areas of medicine and thereby become self-designated "specialists." Increasingly, local requirements preclude these kinds of practice arrangements. The term "specialist," used throughout this report, describes individuals who have acquired requisite education in their respective areas of medicine, most of whom have been certified by specialty boards in their chosen areas of study.

Traditionally, graduate medical education has been based in hospitals. During the first quarter of this century, it was common for recent graduates of medical schools to spend a year of "internship" in a hospital to gain practical experience. Some spent the year in hospitals affiliated with, or owned by, medical schools, but for most the internship year was in a hospital not related to any medical school. As residencies were developed for physicians seeking to gain knowledge and skills in a specialty, they, too, were usually based in hospitals that had only tangential relationships with medical schools. Although university-based medical schools were urged to become the major providers of graduate medical education, the development of autonomous, national specialty boards that certified specialists on the basis of their hospital education and national examinations virtually eliminated a role for academic degree programs in medical specialty certification. The hospital remains the principal location of graduate medical education, although in the course of completing a program, residents may be assigned to clinics or ambulatory centers not associated with hospitals and to educational or research facilities in other institutions.

Graduate medical education has grown enormously since World War II, when only a small fraction of physicians had formal education beyond the internship. In 1940, 587 hospitals had a total of 5,118 residency positions (1); in 1976, 1,702 hospitals had a total of 65,046 positions for residents (2). In 1979, 93 percent of the graduating seniors responding to an Association of American Medical Colleges-sponsored survey reported an intent to continue in graduate medical education until they had fulfilled the requirements of a certifying board. The provision of quality graduate medical education, using available resources effectively, is a major concern of the academic medical community and the agencies that provide financial support for residents and faculty.

Medical schools were not much involved in graduate medical education during its initial development in the United States. However, during the past 20 years, graduate medical education has become a major activity of these institutions and their associated teaching hospitals. In 1977, 71 percent of all residents were in residency programs sponsored by the 323 nonfederal members of the Council of Teaching Hospitals of the Association of American Medical Colleges (3). These teaching hospitals, which are owned by, operated by, or affiliated with medical schools, have graduate medical education faculties that are frequently the same as the academic faculty of the medical school. If this formal relationship does not exist, there is a significant identity of the hospital teaching staff with a medical school faculty. In addition to the involvement of members of the Council of Teaching Hospitals, most other teaching hospitals also have medical school affiliations. According to estimates by the National Resident Matching Program, in 1979–80 more than 95 percent of all residents were in programs having some association with a medical school.

This development of consortia of medical schools and teaching hospitals into constellations of institutions dedicated to both undergraduate and graduate medical education has led to the term "academic medical center." A center often includes other professional and allied health schools, biomedical research institutions, ambulatory care centers, rehabilitation institutes, and health maintenance organizations. The term does not necessarily describe a single corporate entity with common management and governance. In some academic medical centers, the chief executive officer of one or more teaching hospitals reports to the dean of the medical school or to a university vice president for health affairs, and all members of the medical staff are members of the medical school faculty. In other academic centers, no teaching hospital executive reports directly to a medical school or university official, although the medical school faculty may have the privilege of appointing or approving the appointment of key clinical staff positions in the hospitals. There are numerous variations between these extremes. While "academic medical center" does not imply a corporate entity, the term does describe a relationship among institutions with an educational mission in common and is illustrative of the fact that teaching hospitals and medical schools recognize graduate medical education as an essential phase in the preparation of physicians that cannot be separated from the mainstream of academic medicine. In the future, it is likely that medical schools and teaching hospitals will develop more common approaches to fulfilling their institutional responsibilities for this important phase in the preparation of physicians.

Influences on GME

The specialty certifying boards have a significant influence on the scope of graduate medical education. The boards establish the educational criteria that residents must attain if they are to be eligible for consideration for certification. This means that each board establishes the minimum length of time for education and training in a specialty and to a significant degree determines the content. Although the boards are independent and autonomous, they have exchanged information through the Advisory Board for Medical Specialties since 1933. In 1970, the advisory board became the American Board of Medical Specialties, expanded its functions, and developed a full-time staff. While the boards rigorously have preserved their individual autonomy, there now is greater consultation among them about changes in their certification requirements and their approaches to the examination of candidates. The power of the boards to shape graduate medical education has generally been used responsibly to achieve high standards for specialty practice. It is imperative that the boards continue to work together and with the academic community to improve the quality and effectiveness of graduate medical education.

Professional specialty societies have a strong influence on graduate medical education. These societies range from small associations of program directors in graduate medical education and medical school department chairmen to large specialty colleges and academies. The Council of Academic Societies of the Association of American Medical Colleges has 55 clinical specialty organization members with a significant interest in graduate medical education. The Council of Medical Specialty Societies now has 24 major specialty colleges and academies as members. Each of these has a close relationship with its corresponding specialty board, and several are directly involved in the approval of the requirements for educational programs in their specialty as one of the sponsors of a residency review committee. Both the Council of Academic Societies and the Council of Medical Specialty Societies provide forums for the discussion and resolution of issues in graduate medical education. The Council of Academic Societies, through its interaction with the Association of American Medical Colleges' Council of Deans and Council of Teaching Hospitals, brings the ideas and concerns of program directors and faculty for graduate medical education to the attention of medical school deans and teaching hospital executives. The Council of Medical Specialty Societies provides an opportunity for academicians and practicing specialists to express and resolve their concerns and communicate them to the specialty boards, the academic community, and the teaching hospitals.

The American Medical Association (AMA) has contributed to the development of graduate medical education. Through its early establishment of standards for internships and residencies and its development of procedures to review and approve hospitals and programs, the American Medical Association, working with the boards and specialty organizations, facilitated the evolution of a national system to ensure the quality of graduate medical education. The report of the AMA's Citizens Commission on Graduate Medical Education in the mid-1960s provided an impetus to begin the restructuring and improvement of graduate medical education (4). Recommendations from that commission continue to shape concepts about graduate medical education at both national and local levels.

Changes in Accreditation

Greater involvement of the certifying boards, the specialty societies, the medical schools, and the teaching hospitals in graduate medical educational issues and policies at the national level was facilitated by the establishment of the Liaison Committee on Graduate Medical Education in 1972. The Liaison Committee on Graduate Medical Education is sponsored by the Association of American Medical Colleges, the American Board of Medical Specialties, the American Hospital Association, the American Medical Association, and the Council of Medical Specialty Societies. It is responsible for the accreditation of graduate medical educational programs. Prior to its formation, the review and approval of graduate programs was the responsibility of the Council on Medical Education of the American Medical Association. In the early 1950s, the council established residency review committees in cooperation with the specialty boards and some specialty colleges. These committees recommended the minimum requirements for approval of programs and reviewed them to determine if they met the requirements. Approved programs were listed in a directory published by the American Medical Association. The Liaison Committee on Graduate Medical Education has provided a broader perspective on policy issues and has made significant progress toward improving the accreditation process and ensuring more consistent quality of graduate programs across the nation. Effective 1981 the Liaison Committee on Graduate Medical Education was reorganized and renamed the Accreditation Council for Graduate Medical Education. This development is discussed in Appendix 1.

An Essential Phase

Graduating medical students today face an imposing array of career options and choices. The decision for their first graduate year is the first step in shaping their careers. For most, the decision will determine which specialty they will ultimately practice. Their opportunities to learn and progressively assume appropriate responsibility for the care of patients depend upon the resources of their institutions and the abilities and educational commitment of their faculty. The characteristics of the hospitals and programs they enter will determine to what degree they will pursue scholarly inquiry and make academic contributions. Residents' opportunities and responsibilities to be teachers and scholars, as well as learners, depend upon their institutional environment. Graduate medical education has become far more than a period of practical experience before entering independent practice. It is a major determinant of physicians' careers and the quality of medical practice in the United States.

In the 1980s, over 16,000 students will graduate annually from the 126 medical schools accredited by the Liaison Committee on Medical Education. The vast majority will spend three to seven years as residents in graduate education. Because the residency period shapes careers and determines the number and types of specialists who will enter medical practice, it has come under increasing scrutiny. Public and private agencies concerned with the medical services now available, and the services to be provided in the future, view the manipulation of graduate medical education as an expedient approach to doing something about changing medical practice. Certainly the availability of opportunities for graduate medical education in any specialty will determine the number of physicians educated and trained as proficient practitioners of the specialty. However, modifying the number of well prepared specialists in any discipline will not change medical practice unless reimbursement policies and practice privileges are also reshaped. Advances in biomedical knowledge and their application to clinical medicine can be expected to continue. The effective adaptation of the practice of medicine to its increasing complexity cannot be accomplished simply by manipulating graduate medical education and the institutions that provide it.

Long-term policies for the stable financing of graduate medical education are needed. Their development will require understanding and agreement between the providers of graduate medical education and those responsible for its financial support. Because graduate medical education is financed largely by revenues generated through reimbursements to teaching hospitals from the public and private agencies responsible for paying for medical care, it is essential that these agencies, medical schools, clinical faculties, and teaching hospitals reach an accord regarding the purpose of graduate medical education and policies to provide stable funding.

The foregoing suggest that graduate medical education has become as important as undergraduate medical education in the preparation of physicians. It has evolved from a short period of practical experience in a hospital into a formalized, structured educational program, the completion of which is necessary for physicians to be capable of practicing medicine at a level consistent with current knowledge and technology and anticipated developments. While still based primarily in hospitals, graduate medical education is now a major concern of the medical schools. It shapes the careers of medical school graduates and determines the spectrum of qualified specialists that will be available. The evolution of graduate medical education from 1844, when the first medical specialty society was founded, until 1981 is chronicled in Exhibit 1.

EXHIBIT 1

Chronology of Events in the History of Graduate Medical Education, 1844–1981

1844	Founding of American Psychiatric Association.
1847	Founding of American Medical Association.
1864	Founding of American Ophthalmological Society.
1867	Founding of American Otological Society.
1875	Founding of American Neurological Association.
1876	Founding of American Gynecological Society.
	Founding of American Dermatological Association.
	Founding of Association of American Medical Colleges by representatives of 22 medical schools. Its purpose was to raise the standards of medical education. Initial recommendations from the Association of American Medical Colleges included that medical schools offer three courses of lectures and that no candidate be graduated until examined in all branches of medicine.
1879	Founding of American Laryngological Association.
1880	Founding of American Surgical Association.
1887	Founding of American Orthopaedic Association.
1888	Founding of American Pediatric Society.
1896	Founding of American Academy of Ophthalmology and Otolaryngology.
1898	Founding of American Hospital Association.
1899	Founding of American Society of Colon and Rectal Surgery.
	Founding of Western Ophthalmic and Otolaryngological Association, which in 1903 became the American Academy of Ophthalmology and Otolaryngology.
1902	Founding of American Urological Association.
1904	Formation of Council on Medical Education of the American Medical Association to report on medical education to the House of Delegates, make suggestions for improvement, and act as the American Medical Association's agent in its effort to raise standards.
1910	*Medical Education in the United States and Canada*, by Abraham Flexner, was published by the Carnegie Foundation for the Advancement of Teaching. The report, a detailed survey of medical

EXHIBIT 1 (Continued)

schools, demonstrated the urgent requirement for stringent raising of standards of admission and instruction.

1912 Founding of Federation of State Medical Boards.

First survey of internships by the Council on Medical Education of the American Medical Association.

1913 Founding of American College of Surgeons. The major issues driving the formation of the college were the need to establish criteria for recognition of the qualified surgeon, stipulation of standards for training surgeons, and corollary concern with abolishing the practice of fee-splitting. One of the first activities of the college was the Hospital Standardization Program, which later developed into the Joint Commission on Accreditation of Hospitals.

1914 First list of hospitals with approved internships published by the Council on Medical Education of the American Medical Association.

1915 Founding of National Board of Medical Examiners, a voluntary examining board, as an alternative to legal control of state medical licensure. A major issue involved in the formation of the national board was the necessity for some method to provide reciprocity for medical licensing procedures.

Founding of American College of Physicians. The early focus of the college was the physiological and chemical bases of disease—biological medicine. Practitioners of internal medicine who had a scientific orientation considered themselves to be specialists.

1917 The American Board of Ophthalmic Examinations was formally incorporated by the American Ophthalmological Society, the Academy of Ophthalmology and Otolaryngology, and the Section on Ophthalmology of the American Medical Association. In 1933, it was renamed the American Board of Ophthalmology. The formation of the board was the first joint action of the specialist organizations.

1919 The *Essentials of an Approved Internship* was first published. The *Essentials* represented standards set for internships by the Council on Medical Education of the American Medical Association.

1920 The Council on Medical Education of the American Medical Association created 15 committees to recommend preparation essential for expertness in each of the specialties. As a result of these committee reports, *Principles Regarding Graduate Medical Education*, listing the minimum requirements for the education of physicians in these specialties, was published in 1923. By 1928, the *Principles* had become the *Essentials of Approved Residencies and Fellowships*.

The Graduate Committee Report of the Council on Medical Education of the American Medical Association was published. Among its findings was a recommendation that graduate medical training be provided in programs with strong university ties and the granting of graduate degrees for specialty education.

1921 The United States Veterans Bureau was established with most veterans' programs, including medical care, transferred to the bureau. In 1930 the few remaining functions pertaining to veterans were consolidated into the bureau, and it was renamed the Veterans Administration.

During this time, the technology available to medicine was increased largely as a result of World War I. The cost of medicine was becoming an issue and led to the development of insurance programs. Assessment of physicians entering the military during the war led to further concern over the quality of physician training, and increasing specialization was mandating a more organized health care delivery system. The relative balance of generalism and specialism was being questioned.

1923 Founding of American College of Radiology.

1924 Five specialty societies representing otolaryngology established the National Board of Examiners in Otolaryngology.

1927 First listing of residency training programs was published by the American Medical Association.

1928 The House of Delegates of the American Medical Association approved the *Essentials of Approved Residencies and Fellowships*.

1930 Founding of American Board of Obstetrics and Gynecology.

Founding of American Academy of Pediatrics.

EXHIBIT 1 (Continued)

The Ransdell Act established the National Institute of Health. It provided funds for the construction of a laboratory and for a stable and continuing program of research fellowships.

1931 Founding of American Society of Plastic and Reconstructive Surgeons.

Founding of American Society of Anesthesiologists.

1932 Founding of American Board of Dermatology and Syphilology.

The Commission on Medical Education of the Association of American Medical Colleges (primarily concerned with undergraduate education) and the Committee on the Costs of Medical Care (a national committee charged with the evaluation of the organization and the availability of scientific medicine) recommended development of standards and formal recognition for medical specialists.

1933 The Advisory Board for Medical Specialties was formed by the Boards of Otolaryngology, Dermatology, Ophthalmology, and Obstetrics and Gynecology and by the Association of American Medical Colleges, the National Board of Medical Examiners, the Federation of State Medical Boards, and the American Hospital Association. The advisory board was an outgrowth of the rapid development of specialty boards; its purpose was to advise organizations concerning the coordination of the education and certification of medical specialists.

Founding of American Board of Pediatrics.

Founding of American Academy of Orthopaedic Surgeons.

1934 Founding of American Board of Orthopaedic Surgery.

Founding of American Board of Radiology.

Founding of American Board of Psychiatry and Neurology.

1935 Founding of American Board of Urology.

The Social Security Act (P.L. 74-241) was legislated. For the first time, this law provided grants-in-aid to states for public health activities such as maternal and child care and to crippled children, the blind, and the aged.

1936 Founding of American Board of Internal Medicine.

Founding of American Board of Pathology.

1937 Founding of American Board of Surgery. At the same time, the American Board of Anesthesiology and the American Board of Plastic Surgery were formed as affiliates of the American Board of Surgery. Both anesthesiology and plastic surgery developed independent certifying boards in 1941.

The American College of Surgeons began a program to set standards for surgical education.

1938 Founding of American Academy of Dermatology.

Founding of American Academy of Physical Medicine and Rehabilitation.

Formation of Advisory Council on Medical Education, Licensure, and Hospitals. The council was organized by Dr. Willard C. Rappleye and was to be a coordinated council of the various organizations concerned with medical education. Organizations invited to join the advisory council were the Association of American Medical Colleges, the American Medical Association, the American Hospital Association, the Federation of State Medical Boards, the Advisory Board for Medical Specialties, the National Board of Medical Examiners, the American College of Surgeons, the American College of Physicians, the Association of American Universities, the American Public Health Association, and the American Association for the Advancement of Science. In 1939 the House of Delegates of the American Medical Association "disapproved a recommendation that the Council on Medical Education and Hospitals be authorized to send three representatives to act on the Advisory Council on Medical Education and Hospitals." The advisory council dissolved in 1944.

1939 First list of hospitals approved for graduate surgical education published by the American College of Surgeons. At the same time, the "Fundamental Requirements for Graduate Training in Surgery" was published.

The first syllabus for graduate training published by the American Board of Dermatology.

EXHIBIT 1 (Continued)

1940 Founding of American Board of Neurosurgery.

The Council on Medical Education of the American Medical Association was developing cooperative arrangements with 10 of the certifying boards for reviewing residency programs. A joint conference committee in internal medicine (Council on Medical Education, American College of Physicians, and the American Board of Internal Medicine) held its first organizational meeting. These efforts were interrupted by World War II.

The Directory of Medical Specialists was published for the first time by the Advisory Board for Medical Specialties.

The Report of the Commission on Graduate Medical Education, *Graduate Medical Education*, was published. The commission, chaired by Dr. Willard C. Rappleye, recommended the residency as the most satisfactory form of specialty training organized as an educational experience and a joint responsibility of universities and hospitals. The report encouraged a general internship in a hospital with an educational structure, preferably related to a medical school. The internship was to serve either as the first year of specialty training or preparation for general practice.

The National Defense Research Committee was created by President Franklin D. Roosevelt. In 1941 it became a part of the Office of Scientific Research and Development. The military, confronted with an increasing number of medical problems, turned to civilian laboratories for assistance. Federally funded research in the sciences during the war embraced many fields of medicine, and provided the impetus for both a growth in knowledge in biomedical disciplines and their application to medical problems.

1942 Formation of the Liaison Committee on Medical Education by the Association of American Medical Colleges and the American Medical Association to accredit medical schools.

1943 Founding of American Academy of Allergy.

1944 P.L. 346, the Serviceman's Readjustment Act (GI Bill), was passed. The GI Bill offered World War II veterans benefits providing them tuition and living allowances for both undergraduate and graduate medical education. Returning physicians were offered subsidized residency training; hospitals were able to claim a subsidy for training residents. The benefits of the GI Bill reinforced a rapid shift toward specialty training.

1946 P.L. 293 was enacted by Congress and created the Department of Medicine and Surgery within the Veterans Administration. P.L. 293 gave the Veterans Administration authority to establish residencies in teaching hospitals associated with medical schools and mandated the Department of Medicine and Surgery to evaluate the quality of care in Veterans Administration hospitals.

1947 Founding of American Academy of General Practice.

Founding of College of American Pathologists.

1948 Founding of American College of Obstetricians and Gynecologists.

The Liaison Committee for Specialty Boards was formed with equal representation from the Advisory Board for Medical Specialties and the American Medical Association. Its purpose was to make recommendations for recognition of new specialty boards. The Liaison Committee for Specialty Boards developed and approved the *Essentials for Approval of Examining Boards in Medical Specialties*.

A proposal to establish a rationing system for house staff on the basis of a hospital's annual admissions was rejected by the Council on Medical Education. Developments that led to the proposal of a rationing plan included a rapid growth in the number of internships and residencies created to accommodate the wartime students and veterans with GI benefits returning after World War II. The house staff had become an essential part of hospital staffing patterns; interns and residents provided 24-hour, on-call service and performed the growing battery of preliminary diagnostic tests. No controls were established over the burgeoning number of graduate training positions offered. Instead, as a result of the need to regulate competition among hospitals and introduce some order into the selection process, a national plan for internship matching was initiated.

1949 The Joint Educational Committee in Internal Medicine was reactivated. The participants included the Council on Medical Education of the American Medical Association, the American College of

EXHIBIT 1 (Continued)

Physicians, and the American Board of Internal Medicine. In 1953 the committee was renamed the Residency Review Committee for Internal Medicine.

1950 The Joint Conference Committee on Graduate Training in Surgery was formed with equal representation from the American Board of Surgery, the American College of Surgeons, and the Council on Medical Education of the American Medical Association. The review committees for internal medicine and surgery were empowered to act in approving residency programs on behalf of their constituent organizations and became the model for accrediting graduate educational programs for all specialties.

The passage of the Omnibus Medical Research Act gave the surgeon general authority to establish new disease-oriented institutes, and became the instrument of choice for federal support of biomedical sciences.

1951 The Joint Commission on Accreditation of Hospitals was formed as a successor to the hospital standardization program initiated by the American College of Surgeons. Its current sponsors are the American College of Physicians, the American College of Surgeons, the American Hospital Association, and the American Medical Association.

The National Intern Matching Program was formed under the guidance of the American Medical Association, the Association of American Medical Colleges, the American Hospital Association, and student representatives. In 1978 it was renamed the National Resident Matching Program. Its current sponsors are the Association of American Medical Colleges, the American Medical Association, the American Protestant and Catholic Hospital Associations, the American Hospital Association, the Council of Medical Specialty Societies, the American Board of Medical Specialties, and the American Medical Student Association.

1952 A proposal was introduced to the Council on Medical Education of the American Medical Association that committees (such as for internal medicine and surgery) be developed in cooperation with the certifying boards so that they could act for both groups in approval of hospitals for residency training. By 1953 five specialty boards—Orthopaedic Surgery, Otolaryngology, Pediatrics, Proctology, and Radiology—had expressed interest in establishing residency review committees.

1953 The report by Drs. John E. Deitrich and Robert C. Berson, *Medical Schools in the United States at Mid-Century*, was published by the Association of American Medical Colleges. The result of an Association of American Medical Colleges-sponsored survey, the report dealt with the rapid development of the sciences and their application to diagnosis and treatment, changes that had altered the character of the medical schools.

1954 Founding of American College of Preventive Medicine.

Founding of Society of Nuclear Medicine.

Formation of the Internship Review Committee by the Academy of General Practice, the American Hospital Association, the American Medical Association, the Association of American Medical Colleges, and the Federation of State Medical Boards. On the basis of the *Essentials of an Approved Internship*, the Internship Review Committee reviewed and accredited programs in the same fashion as the developing residency review committees.

1955 *Medical Research Activities of the Department of Health, Education, and Welfare* (the Long Report), a report by the Special Committee on Medical Research of the National Science Foundation, was published. The report found the growth of medical research salutary and recommended its further expansion.

1957 The Educational Council for Foreign Medical Graduates was created by the American Medical Association, the Association of American Medical Colleges, the Federation of State Medical Boards, and the American Hospital Association. Its purpose was to sponsor an examination that would assess the knowledge of foreign medical graduates and to provide a certificate to interns and residents from foreign medical schools that would allow them to enter U.S. training programs and assume patient care responsibilities.

1958 The Bayne-Jones Report, *The Advancement of Medical Research and Education*, was prepared by the Secretary's Consultants on Medical Research and Education and published by the Department of

EXHIBIT 1 (Continued)

Health, Education, and Welfare. The report called for an increased output of physicians and suggested the creation of from 14 to 20 new medical schools by 1970.

1959 The *Final Report on Preparation for Family Practice* was published. The report was the product of a joint committee of representatives from the Association of American Medical Colleges, the American Medical Association, and the American Academy of General Practice. The report recommended two-year hospital programs consisting largely of internal medicine and pediatric training—in effect, a two-year mixed internship.

The Report of the Surgeon General's Consultant Group on Medical Education, *Physicians for a Growing America* (the Bane Report), was published. The Report recommended that the number of physicians graduated from schools of medicine and osteopathy be increased and that a federal program of student aid be enacted. The Bane Report set a national goal for 1975 of 330,000 physicians.

1960 The Report of the Committee of Consultants on Medical Research, *Federal Support of Medical Research* (the Boisfeuillet Jones Report), was published by the Subcommittee on the Departments of Labor and Health, Education, and Welfare of the Senate Appropriations Committee. The report called for more research and research training funds and recommended federal support of medical schools and medical education.

1963 The first bill to aid medical education, P.L. 88-129, the Health Professions Educational Assistance Act, was signed into law by President John F. Kennedy. Its purpose was to expand enrollment in medical schools, dental schools, and other health education institutions; it provided matching grants for construction and expansion of health professional schools and loans for students in medicine, osteopathy, and dentistry.

1964 Founding of Society of Thoracic Surgeons.

The Ad Hoc Committee on Education for Family Practice (Willard Committee) was established by the American Medical Association. The Committee Report, *Meeting the Challenge of Family Practice*, endorsed board certification for family practitioners and development of new programs for the education of family physicians.

1965 The Coggeshall Report, *Planning for Progress Through Medical Education*, was published by the Association of American Medical Colleges. The document, written by Dr. Lowell T. Coggeshall, recommended broader and enlarged responsibility for the Association of American Medical Colleges and a wider social and educational role by individual medical schools, encompassing not only undergraduate but also graduate and continuing medical education. Providing leadership in the development of improved approaches to family practice and increased interaction with the federal government were also suggested goals for the Association.

P.L. 89-97, Social Security Amendments of 1965. The law established a Social Security hospital insurance program for the aged and a voluntary supplementary medical insurance program (Medicare) and grants to states for medical assistance programs (Medicaid).

P.L. 89-290, Health Professions Educational Assistance Amendments of 1965. These amendments continued emphasis on expansion of enrollment through construction grants; they initiated provisions for basic and special improvement grants for improving curriculum. The legislation also introduced loan forgiveness for graduates who practiced in physician shortage areas.

The Tri-College Council was established by the American College of Obstetricians and Gynecologists, the American College of Physicians, and the American College of Surgeons. The name of the organization was later changed to the Council of Medical Specialty Societies.

1966 *The Graduate Education of Physicians* (the Report of the Citizens Commission on Graduate Medical Education) was published. The commission, chaired by Dr. John S. Millis and sponsored by the American Medical Association, recommended that the internship be abandoned and that the internship and residency be combined into a single period of graduate medical education called a residency and planned as a unified whole. Other recommendations were that a "Commission on Graduate Medical Education" be established to plan, coordinate, and review standards for graduate medical education and that graduate programs for primary physicians be developed.

EXHIBIT 1 (Continued)

1967 *The Report of the National Advisory Commission on Health Manpower* was published. President Lyndon B. Johnson established the advisory commission to develop recommendations for action by government or by private institutions for improving availability and utilization of health manpower. Recommendations of the report included one that the production of physicians be increased beyond current levels by a substantial expansion in existing medical schools and by continued development of new schools.

The Council of Medical Specialty Societies was incorporated by the membership of the Tri-College Council with the purpose of promoting communication and joint action by the large specialty colleges, academies, and associations representing practicing specialists in the United States. The Council of Medical Specialty Societies currently represents the 24 major medical specialty organizations.

1968 The Council of Academic Societies of the Association of American Medical Colleges sponsored a national conference on the role of the university in graduate medical education. The AAMC approved the concept that the academic medical center should assume the responsibility for graduate medical education. The publication, *The Role of the University in Graduate Medical Education*, was developed from this conference.

P.L. 90-490, the Health Manpower Act. The law continued emphasis on expansion of medical school enrollment; it gave priority to assisting medical schools in financial distress; special improvement grants were renamed special project grants.

1969 Founding of American Board of Family Practice.

1970 The Advisory Board for Medical Specialties was renamed the American Board of Medical Specialties.

P.L. 91-519, the Health Training Improvement Act. The legislation enacted emergency assistance to medical schools in financial distress.

P.L. 91-623, the Emergency Health Personnel Act. The National Health Service Corps was created to provide health professionals for health manpower shortage areas.

1971 P.L. 92-157, the Comprehensive Health Manpower Training Act. The act authorized a program of capitation grants; medical schools were required to expand enrollment, conduct specified programs (such as interdisciplinary health professions training), or expand enrollment of disadvantaged students. It continued financial aid to new medical schools and added grants for graduate training in family medicine.

1972 The Liaison Committee on Graduate Medical Education was formed by the American Medical Association, the Association of American Medical Colleges, the American Board of Medical Specialties, the Council of Medical Specialty Societies, and the American Hospital Association. It was charged with the accreditation of graduate medical education. The Coordinating Council on Medical Education was also formed by the same organizations. The Coordinating Council was to consider policy matters for both undergraduate and graduate medical education for referral to parent organizations. It was also expected that the Coordinating Council would develop a Liaison Committee on Continuing Medical Education.

P.L. 92-541, the Veterans Administration and Health Manpower Training Act. This law authorized the Veterans Administration to assist in establishing eight state-supported medical schools and to provide grant support to existing medical schools.

1973 *Evaluation in the Continuum of Medical Education* (the Report of the Committee on Goals and Priorities of the National Board of Medical Examiners, chaired by Dr. William D. Mayer) was published. The GAP Report, as it became known, advised that the national board abandon its traditional three-part examination for certification and, instead, develop a single exam to be given at the interface between undergraduate and graduate medical education. The exam was to certify graduating medical students for limited licensure to practice in a supervised setting. The committee also recommended that the national board expand its role in the evaluation of students in residency training, and, further, that full licensure as an independent practitioner be based on the certifying examination for a specialty.

1975 The Liaison Committee on Graduate Medical Education began to accredit residency training programs.

EXHIBIT 1 (Continued)

The Report of the Coordinating Council on Medical Education, *Physician Manpower and Distribution: The Primary Care Physician*, was published. The report recommended that institutions responsible for graduate medical education, including university hospitals, should be encouraged to establish residencies in family practice, internal medicine, and pediatrics with orientation toward primary care. It further recommended that the American Boards of Internal Medicine and Pediatrics redefine their certifying requirements so that educational programs and careers of internists and pediatricians have the same professional prestige as those in subspecialty categories.

A joint study by the American College of Surgeons and the American Surgical Association, *Surgery in the United States: A Summary Report of the Study of the Surgical Services for the United States*, was published. The study, the most extensive study of physician manpower and distribution produced among the surveys by large specialty organizations at this time, suggested that the number of residents completing their training in all surgical specialties was in excess of the number required and recommended that the number of surgical residency positions be controlled.

1976 The Graduate Medical Education National Advisory Committee was chartered, charged to take national leadership in developing programs addressed to graduate medical education; in the research, development, and analysis of programs that impact on the health manpower needs of the nation; and for making recommendations on overall strategies for future supply and requirements of physicians by specialty and geographic location.

The Institute of Medicine of the National Academy of Sciences published the final report of the Social Security Studies, *Medicare—Medicaid Reimbursement Policies*. The report was concerned principally with determining appropriate and equitable methods by which Medicare and Medicaid can pay for physician services in teaching hospitals. The report also contained recommendations regarding specialty and geographic distribution of physicians, including more equitable support for ambulatory care services, direct support to medical schools and teaching hospitals for primary care training, a reduction in the number of trainees in the non-primary care specialties, and elimination of existing incentives for foreign physician immigration into the United States.

The report of the Coordinating Council on Medical Education, *Physician Manpower and Distribution: The Role of the Foreign Medical Graduate*, was published. The report made a series of recommendations regarding policies affecting the entrance of foreign medical graduates into the United States, their education and training in appropriate institutions, and their effective utilization in the U.S. health care system. The report suggests that U.S. medical schools graduate enough physicians to meet the country's health requirements.

P.L. 94-484, the Health Professions Educational Assistance Act of 1976. The capitation grant program was extended; however, medical schools were required to have a specified percentage of filled first-year positions in primary care residencies and required to increase third-year medical student class size to accommodate U.S. citizens enrolled in foreign medical schools. Construction grants were expanded for ambulatory care and primary care teaching facilities. Primary care training grants were expanded to include programs in general internal medicine and general pediatrics. Restrictions were placed on the entry of alien physicians who were graduates of foreign medical schools into U.S. residency training programs.

P.L. 94-368, Medicare Extension Amendments. The legislation delayed effective dates of some Medicare provisions, including Section 227, relating to reimbursement of teaching physicians.

Subsequent to a petition by the residents at Cedars-Sinai Medical Center in Los Angeles for recognition of a collective bargaining unit under the provisions of the National Labor Relations Act, the National Labor Relations Board ruled that residents were principally students and, therefore, not eligible for collective bargaining under the National Labor Relations Act.

1977 The Liaison Committee on Continuing Medical Education was formed by the American Medical Association, the Association of American Medical Colleges, the Council of Medical Specialty Societies, the American Board of Medical Specialties, and the American Hospital Association.

The Association of American Medical Colleges established the Task Force on Graduate Medical Education to review the major problems and issues facing graduate medical education and to recommend changes in this phase of the preparation of physicians.

EXHIBIT 1 (Continued)

1978 Publication of the General Accounting Office Report to the Congress of the United States, *Are Enough Physicians of the Right Types Trained in the United States?* The report discusses the supply of physicians in the United States, graduate medical education programs, and the roles of the medical profession, the states, and federal agencies in training appropriate numbers and types of physicians. The single recommendation of the report was that the Secretary of Health, Education, and Welfare request the Coordinating Council on Medical Education to enter a contract to develop and implement a system that would ensure training of an optimal number and mix of specialists.

1979 The American Medical Association withdrew from the Liaison Committee on Continuing Medical Education.

The American Board of Medical Specialties recognized the American Board of Emergency Medicine as a conjoint specialty board consisting of representatives from the American Boards of Surgery, Internal Medicine, Family Practice, Psychiatry and Neurology, Obstetrics and Gynecology, Pediatrics, and Otolaryngology; the American College of Emergency Physicians; the University Association for Emergency Medicine; and the Section on Emergency Medicine of the American Medical Association.

H.R. 2222 was defeated. H.R. 2222 would have designated residents as employees and given them the opportunity for collective bargaining under the National Labor Relations Act.

1981 The Liaison Committee on Graduate Medical Education was reorganized and transformed into the Accreditation Council for Graduate Medical Education under the auspices of the same sponsoring organizations. The Coordinating Council on Medical Education was abolished and replaced by the Council for Medical Affairs.

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Chapter 2

The Quality of Graduate Medical Education

Graduate medical education in the United States is generally recognized and accepted as an essential phase of medical education. Nearly all senior medical students spend three or more years in graduate education before they enter practice (5). The Liaison Committee on Medical Education, which accredits medical schools, adopted the following policy statement in 1973 (6):

> The undergraduate period of medical education leading to the M.D. degree is no longer sufficient to prepare a student for independent medical practice without supplementation by a graduate training period which will vary in length depending upon the type of practice the student selects.

The quality of graduate education is of prime concern to medical schools, teaching hospitals, their faculties, their students, and the public. The quality of any educational endeavor must be judged ultimately on the basis of whether or not the students are prepared to achieve established goals. A discussion of the quality of graduate medical education, therefore, must begin with a consideration of its goals.

In 1940 the Commission on Graduate Medical Education, sponsored by the Advisory Board for Medical Specialties, published an extensive report on the status of graduate medical education and made many recommendations for its improvement. The commission described the goals of graduate medical education as follows (7):

> The residency is no longer considered by leading medical educators and practitioners to be merely a period for acquiring proficiency in special technics. Rather, it is looked upon as a progressive and graduated educational experience which is designed, first, to enable a physician to make himself proficient in a special field of practice and second, to give him the educational equipment for continued development within this field. In this concept the residency becomes a true graduate discipline.

During the past 40 years, the goals of graduate medical education have not changed. Graduate medical education is an essential phase of the formal medical education of physicians, and its principal goals are to prepare proficient practitioners of medicine and to equip them for continued professional development. These goals are the standards against which the quality of graduate medical education should be measured.

In the four decades since the commission report, graduate medical education has expanded greatly. Sincere efforts have been made to improve its quality through establishing an accreditation system and expanding the certification of individual physicians by the various specialty boards, but further improvement in the overall quality of graduate medical education in the United States is needed.

The failure to achieve a uniformly satisfactory level of quality is due partially to the historical origins and current organization of graduate medical education. Undergraduate medical education is university-based and is molded by the academic traditions of higher education in the United States. Graduate medical education is principally hospital-based. It developed from a tradition of on-the-job ap-

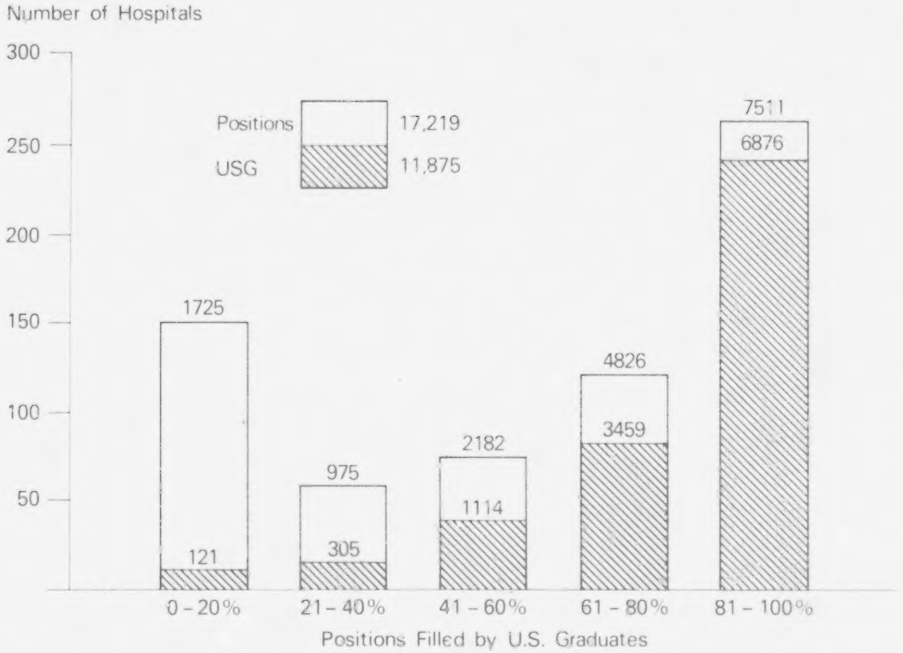

FIGURE 2.1

Distribution of 669 hospitals in the NRMP in 1978 by percentage of first-year positions offered that were filled by U.S. graduates.

prenticeship training. While undergraduate programs are provided by only 126 medical schools, according to the Liaison Committee on Graduate Medical Education,* over 5,000 graduate programs exist in more than 1,700 hospitals and health-care facilities.

The quality of graduate medical education programs depends upon many factors. The number of faculty members and their teaching and clinical abilities are important determinants of quality. The number and types of patients, the degree of responsibility residents are expected to assume, and the adequacy of their supervision also affect program quality. These and other factors lead to judgments about quality by students and those who advise them in the selection of their graduate programs.

Quantitative measures that would explain why some programs are considered superior in quality to others are not available. It seems, however, that U.S. medical students are not attracted to some institutions and programs whose educational quality does not meet their expectations. Since an excess number of positions are available, every graduate position cannot be filled by a U.S. graduate, but there are striking differences in filling among hospitals. Figure 2.1 demonstrates a bimodal distribution among the 669 groups of hospitals that offered 17,219 first graduate year positions to U.S. students in 1978 through the National Resident Matching

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* By ratification of its bylaws by all five parent organizations, the Accreditation Council for Graduate Medical Education officially replaced the Liaison Committee on Graduate Medical Education on January 1, 1981. (See Appendix 1.)

Program. There were 147 hospitals (22 percent) that attracted a total of only 121 U.S. students (1 percent) in the match; these hospitals filled only 0 to 20 percent of their available positions with U.S. students. Ninety-three of these hospitals attracted no U.S. graduates. Of the non-U.S. graduates matched, 578 (39 percent) entered these same 147 hospitals. At the opposite extreme, 268 hospitals (40 percent) attracted 58 percent of U.S. students; thus, they filled 81 to 100 percent of their positions. The remaining 254 hospitals (38 percent) filled 21 to 80 percent of their positions with U.S. graduates. Although comparably precise data on the choices of all U.S. students are not available for earlier years, estimates from matching results through the National Resident Matching Program indicate that many hospitals repeatedly fail to attract U.S. students. Graduates of U.S. medical schools seek to enter those residency programs that they believe will best fulfill their educational needs. Those institutions that do not attract U.S. graduates are clearly regarded as being undesirable.

Although detailed studies of the reasons why U.S. graduates do not enter programs in certain hospitals have not been done, geography has been identified as one determinant. Demographic and cultural characteristics in some locales doubtlessly make certain hospitals less attractive, but in many instances hospitals in similar areas lie at opposite extremes. Figure 2.2 shows that the preponderance of hospitals that fill only 0 to 20 percent of their positions with U.S. graduates are located in the Northeast, Middle Atlantic, and Midwest regions, while those hospitals attracting U.S. students to 80 percent or more of their positions are rather evenly distributed across the nation (Figure 2.3).

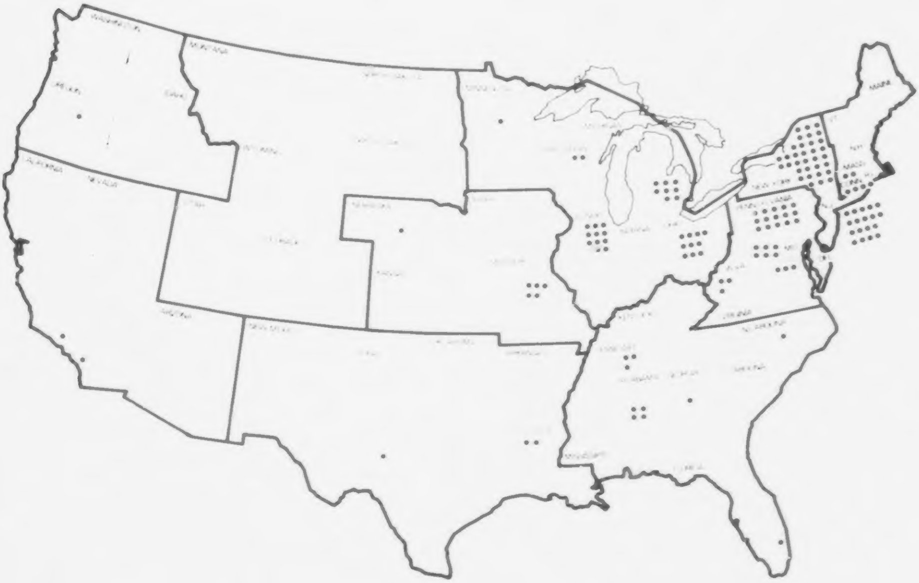

FIGURE 2.2

Location of hospitals in the NRMP in 1978 filling 0 to 20 percent first-year positions by U.S. graduates.

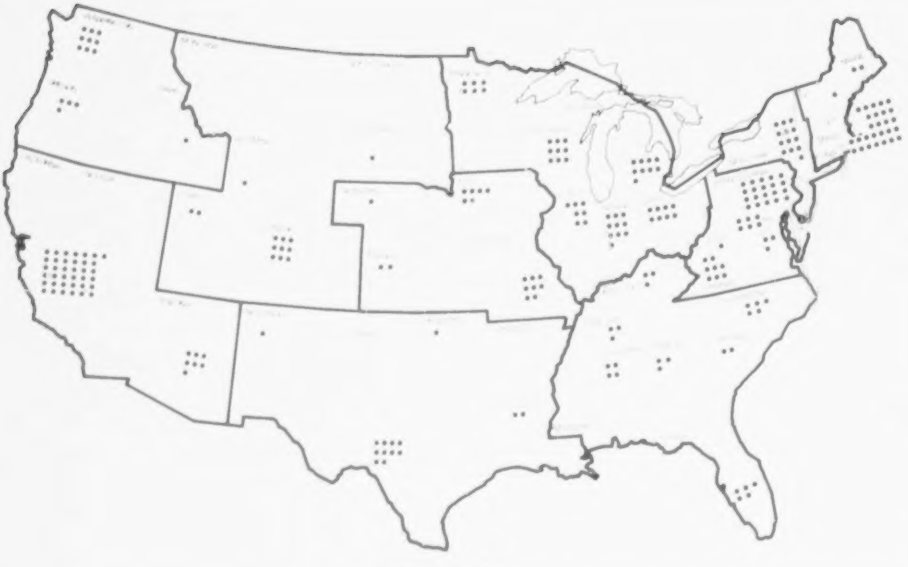

FIGURE 2.3
Location of hospitals in the NRMP in 1978 filling 80 to 100 percent first-year positions by U.S. graduates.

Although U.S. students most often seek appointments in hospitals that are associated with medical schools, this is not always the case. Of the 147 hospitals that filled only 0 to 20 percent of their residency positions with U.S. graduates in the National Resident Matching Program in 1978, 120 were associated with a medical school. Here, the designation "associated hospital" used by the National Resident Matching Program includes any relationship with a medical school for teaching at the undergraduate or graduate level.

The relationship between a teaching hospital and a medical school influences the attractiveness of graduate medical education programs. The association between a school and a hospital may be for undergraduate education only, with a hospital's graduate programs having no relationship to the school. Some associations may have been developed only recently. Large geographic distances may separate a hospital from a medical school and inhibit the development of a close relationship. Although there are impediments to having a hospital's graduate programs made attractive to U.S. graduates by their association with a medical school, the presence of U.S. graduates in residency positions is desirable in hospitals to which undergraduate medical students are assigned. In some instances, National Resident Matching Program data showed that medical schools assigned medical students for required clinical clerkships to services in associated hospitals that in 1977 had not attracted any U.S. students to their graduate programs.

Although certain specialties are currently less attractive to U.S. students than are others, even in the popular specialties of family practice and internal medicine, as depicted in Figures 2.4 and 2.5, approximately one-fifth of the programs filled 40 percent or fewer of their positions with only 5 percent of U.S. students who entered these specialties. Conversely, 83 percent of the students who chose these specialties entered programs that averaged 97 percent filled with U.S. graduates.

In 1978, 1.3 positions in graduate medical education were available per each of the 12,666 graduating students who participated in the National Resident Matching Program. More than 16,000 students are expected to graduate from U.S. medical schools in 1982. It is important that the academic medical community exert a major effort to ensure the educational quality of all programs, and if those programs that U.S. students have avoided in the past are found not to meet minimal standards, they should be discontinued and available resources devoted to those that can meet quality standards.

Changing Dimensions

Clinical education for medical students in the United States begins early in their undergraduate programs when they first interview and examine patients. The basic method for clinical education is the case study. During their third and fourth years, medical students' clinical knowledge, skills, and judgment begin to develop through their assignment to the hospital services of various specialty disciplines. On each service, they are assigned cases and participate in the work-up and study of a cross-section of patients. By graduation, medical students are expected to have acquired basic clinical skills. Generally, they have made decisions about the special areas of medicine that they wish to pursue in the graduate phase.

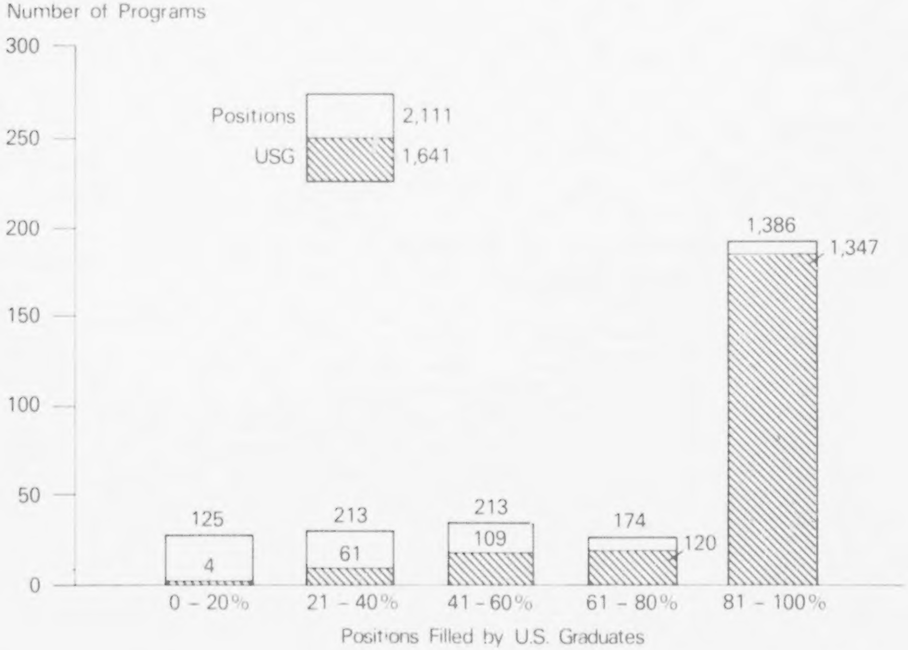

FIGURE 2.4

Distribution of 303 programs in family practice in the NRMP in 1978 by percentage of first-year positions filled by U.S. graduates.

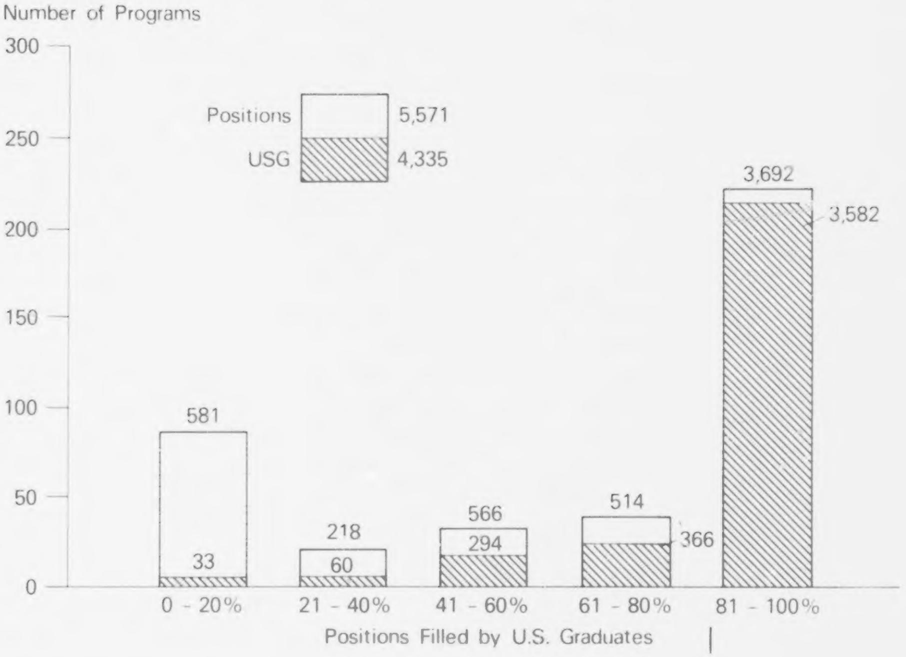

FIGURE 2.5

Distribution of 387 programs in internal medicine in the NRMP in 1978 by percentage of first-year positions filled by U.S. graduates.

Whether their careers will be limited to the practice of medicine or will combine practice with teaching and research, clinicians educated and trained during the graduate phase are expected to assume full responsibility for the care and treatment of patients with diseases and problems requiring the special attention of their disciplines. The public rightfully expects this goal to be achieved and has entrusted to medical schools, to teaching hospitals, and to the Liaison Committee on Graduate Medical Education the responsibility for ensuring that each physician who has completed the graduate phase will have attained the principal goals. The certifying boards in medicine, which have established criteria for the certification of diplomates in their specialties, provide the public with an additional evaluation of medical competence. Specialty colleges and academies whose membership criteria signify the attainment of superior skill also attest to qualifications of excellence. However, the quality of education and training is ultimately the responsibility of graduate programs and the institutions that sponsor them.

When graduate training beyond a year of internship was pursued by relatively few physicians, graduate education was based upon the personal relationship between a mentor and selected students. This relationship established a personal commitment between the teacher and each student. Their day-to-day contact in providing care and treatment to patients permitted the teacher not only to impart his knowledge, skills, and clinical judgment but also to observe the professional growth of each student. When the relationship ended, the teacher was well aware of the capabilities of each student. Each was a class of one, and each pursued a career with the stamp of the mentor shaping his or her approach to clinical practice.

The achievement of this special relationship, which has been the basic tenet of graduate medical education in the past, is now only rarely feasible. Ensuring that each student attains the knowledge, skills, attitudes, and clinical judgment commensurate with graduate medical education's principal goals has become complicated and dependent upon more than a single one-on-one relationship. Several factors account for this.

1. Now almost all graduates continue for three or more years in graduate education. In 1979, 93.2 percent of the U.S. graduating class responding to an Association of American Medical Colleges' survey declared an intent to become certified by a specialty board (8). This demand for certification, combined with a doubling of the number of graduates, has vastly increased the graduate student body and has made it difficult to ensure a consistent quality of experience for each resident.

2. The expansion of graduate programs has required large numbers of patients and faculty. Programs now often involve many institutions, and residents may rotate through several hospitals and relate to multiple service chiefs, co-program directors, and faculty members in the course of their education and training.

3. The provision of highly specialized care necessitates the organization of services within a single institution for that purpose. As a result, residents are rotated from one specialized clinical unit to another, even within the same institution.

The extent of the fragmentation of residents' experiences and the multiplicity of relationships between residents and faculty members vary. Small programs in specialties for which the educational resources can be provided largely by a single hospital service are not likely to have the problems of larger programs in specialties that are dependent upon several hospitals or clinic services for their educational settings. The generalist programs in internal medicine, family practice, and pediatrics are particularly likely to fragment their residents' experiences; and since more than half of all residents are in these specialties, this problem is significant.

From its inception, the accreditation system for graduate medical education has been based upon the preceptorial concept. Most programs are evaluated in isolation from programs in other specialties and with insufficient assessment of the institutional milieu in which they are conducted. Program directors are considered to have complete local authority over their programs. They control the educational plans and destinies of their residents. However, in a recent survey of graduating medical students, 75 percent of the respondents stated that educational merit was a major factor in the choice of a program, whereas only 11 percent cited the desire to work with a particular program director as a major influence (8). The ambience of the hospital was also given by 60 percent as important in their decision (8). Thus, it would appear that U.S. students select their graduate education on the basis of perceived program and institutional quality, not because they desire a preceptorial relationship with an individual. The apparent preference by students for programs with educational merit places a burden of responsibility on medical schools and associated teaching hospitals to ensure that a high standard of quality of graduate medical education is maintained.

An Expanded Concept

The attainment of acceptable universal quality in graduate medical education in the United States has been hampered by the perpetuation of the philosophy that each program in every specialty is independent of all other programs. This philosophy has minimized the interdisciplinary involvement of graduate program faculties in the development of overall approaches to accomplish the principal goals of graduate medical education. The isolation of graduate programs stems from their origin as apprenticeships for physicians who were seeking to acquire knowledge and develop skills from a recognized specialist. This simple organizational model is no longer tenable. The number of graduates needing three or more years of education has vastly increased. Education and training in every specialty require complex resources and involve numerous faculty. Residents in many specialties rotate through other specialty services for part of their education. A change in the academic philosophy and organization of graduate medical education is needed to ensure that the principal goal is attained for every resident. In considering changes, it must be recognized that graduate medical education has unique characteristics and responsibilities which distinguish this phase of the education of physicians from the baccalaureate and medical school phases.

College faculties grant baccalaureate degrees to students demonstrating a level of educational achievement ranging from outstanding to minimally acceptable. Their criteria for granting degrees are based principally upon students' passing a combination of courses which establish sufficient academic credit for graduation. Whether or not all graduates have the knowledge and personal attributes needed to be proficient practitioners in their field is not a principal concern of college faculties.

Medical school faculties, in selecting students from the population of college graduates, attempt to choose those who have both the intellectual ability and the personal qualities deemed necessary to be physicians. Medical school curricula are designed and organized so that students are provided the opportunity to attain the basic knowledge and skills that faculties believe are requisite for the granting of the M.D. degree. In addition, faculties are sensitive to their responsibility to identify students whose attitudes and personal characteristics are inappropriate for the profession of medicine. Their graduation criteria include both requirements for educational achievement and the attainment of acceptable professional skills and behavior; but, in granting the M.D. degree, faculties do not ensure that all graduates will be proficient practitioners in their chosen fields. This is the responsibility of the graduate and final phase of formal medical education. Providing residents an educational program that will afford them the opportunity to become proficient practitioners of their discipline during the final, graduate phase of their formal medical education is a heavy responsibility. Licensing laws and policies do not require as high a level of knowledge and skills as those expected by graduate program faculties. Graduate program directors, their faculties, and the specialty boards are expected to establish the criteria for modern medical practice.

Traditionally, certification by a specialty board has been the credential to distinguish those who are deemed particularly qualified. Granted to individuals on the basis of their having been enrolled in an accredited graduate program for a specified period of time and having passed an examination, specialty board certification has served as an external criterion of accomplishment. Unfortunately, the almost sole reliance upon externally established criteria and the isolation of each specialty's educational program from those of other specialties have retarded the development of local internal educational planning and the establishment of achievement and performance criteria by graduate faculties either within a specialty or in concert with other specialties. If the quality of graduate medical education is to be improved and if all students are to be prepared to be proficient practitioners of their specialties, graduate medical faculties must assume greater responsibility for the quality of their programs and develop internal standards and criteria as well as rely upon the external accreditation and certification systems.

Identifying Faculty

Before discussing how improvement of the internal assurance of quality in graduate medical education should be approached, it is necessary to identify the nation's graduate medical education faculties and their institutional relationships. It is conventional to display data on graduate medical education in terms of programs and hospitals. By this convention, 2,800 programs in 651 hospitals offered 17,087 first graduate year positions through the National Resident Matching Program in 1977. This presentation gives the impression that the graduate medical education faculties in the United States are distributed among numerous programs and in many hospitals. However, it obscures an important institutional relationship that must be recognized in future planning for graduate medical education. Of the 651 hospitals offering first graduate year positions in 1977, 605 were associated with medical schools, and only 46 were unassociated. In 1977, 12,588 U.S. medical graduates who entered non-military residencies began their graduate medical education in teaching hospitals associated with medical schools. Only 228 were in unassociated hospitals (9). This aggregation of graduate medical education data by medical school–teaching hospital relationships strongly suggests that graduate medical education in the United States today is principally provided by the full-time and voluntary members of medical school faculties. Furthermore, it means that academic medical centers and teaching hospitals have the responsibility for the education and training of two classes of students—the undergraduate class admitted from college and the graduate class admitted from medical school.

The fact that the institutional settings and faculties for undergraduate and graduate medical education often coincide does not mean that the approach to internal assurance of quality for graduate medical education should or can be the same as for undergraduate. In the undergraduate phase, a class of students is sequentially taught by many faculty members from both basic and clinical science disciplines. Members of the class are observed in many settings, and the assessment of their achievement and performance is derived from multiple opinions. The degree is granted on the basis of a faculty consensus.

In graduate medical education, the faculty of each clinical discipline or specialty has the principal responsibility for developing the necessary resources and planning the education for the students in its program. Based upon minimal standards set by the external accreditation and certification systems, programs vary in length and resource requirements. Heretofore, graduate faculties generally have not been expected to examine whether or not the separate programs in their institutions go beyond the minimal national requirements and are achieving the principal goals of graduate medical education for every student for whose education they are responsible.

Resisting Change

In November 1971 the Assembly of the Association of American Medical Colleges approved a statement urging that the academic medical centers assume institutional responsibility for graduate medical education. Guidelines were subsequently articulated to assist faculties seeking to develop a plan for institutional assumption of responsibility for the various residency programs in their academic centers (10). A survey of U.S. medical schools in 1974 revealed that only 19 centers had definitely established procedures for implementing this concept (11).

The concept that institutions should ensure the quality of their programs in graduate medical education is resisted at both national and local levels. This resistance stems, in part, from concerns that such an emphasis would undermine the accreditation authority of the Liaison Committee on Graduate Medical Education and the residency review committees and the certification authority of the medical specialty boards. The specter of "institutional accreditation" is raised with the implication that eventually the review of programs by the residency review committee of each specialty would be superseded by blanket institutional authority to conduct programs in the various specialties without regard to a national standard. Less frequent concerns are that certification of individuals by national specialty certifying boards might be viewed as less necessary because institutions eventually might provide individual recognition of accomplishment by some form approximating the granting of a degree.

Resistance also derives from the fears of program directors that their autonomy would be compromised if local institutional review of the quality of their programs is initiated. Finally, in the aggregate, the teaching and administrative staffs of teaching hospitals are concerned that their autonomy would be compromised by the medical schools with which they are associated.

This resistance to greater institutional interdisciplinary responsibility for the quality of graduate medical education is decreasing. Interdepartmental graduate education committees have been established in some teaching hospitals, and, according to information in mailing rosters maintained by the Association of American Medical Colleges, 115 medical schools have identified individuals with administrative responsibility for graduate medical education.

In 1980 the Liaison Committee on Graduate Medical Education presented a revision of the General Requirements section of the "Essentials of Accredited Residencies" to its sponsoring organizations for ratification. The revision requires that institutions adopt internal policies and procedures to ensure the quality of the graduate medical education programs they sponsor. Implementation of the revised General Requirements should enhance the attention of institutions to their educational responsibilities.

Institutional Quality Control

While continuing the organization of graduate medical education by specialty, with program directors and their faculties having major responsibility for planning, supervising, and evaluating programs, and with the Liaison Committee on Graduate Medical Education and the residency review committees setting national standards for program accreditation, each institution that provides graduate medical education should involve administrators, program directors, their faculties, and residents in the allocation of educational resources and in the local evaluation of the quality of their programs.

(Conference discussants offered the following suggestions: (*a*) that the definition of institutional responsibility or involvement be clarified; (*b*) that the emphasis be on the intrainstitutional monitoring of quality; (*c*) that the issue is not whether medical schools or hospitals should control

> and govern graduate medical education programs but that the sponsoring institution or institutions, however defined, must assume responsibility for educational quality; and (*d*) that this responsibility goes beyond the specialty in which the education takes place.)

Graduate medical education, like education in other fields, is increasingly specialized. A faculty with particular knowledge and skills in a discipline is required if residents are to be educated and trained as proficient practitioners of the discipline, and national standards for their education and training are needed. It can, therefore, be expected that graduate medical education will continue to be organized by specialty. However, delegating the major responsibility to a faculty composed of specialists in the clinical discipline should not render them immune from being accountable to their colleagues in other specialties for the quality of their program. *The quality of all programs in an institution should be the concern of the entire institution.* How institutions develop and implement approaches to the allocation of resources and the surveillance of programs will vary, depending upon program size and complexity. No particular administrative approach should be imposed in all settings. Whatever the approach, it should facilitate collegial interaction among specialty faculties, residents, and administrators; promote constructive criticism; and permit the correction of identified deficiencies.

The national standards for education in each specialty provide a useful benchmark against which to measure the minimal requirements for programs. Without question, programs that cannot meet national standards should not be accredited. However, there is considerable diversity in the characteristics of the institutions that provide medical education, and opportunities for the enrichment of the educational experience made possible by this diversity should be encouraged.

> *Program directors and their staffs should strive to supplement national standards to achieve the principal goals of graduate medical education in their institutions and specialties based upon local resources and institutional missions. In planning and conducting their programs, they should view adherence to the national standards established by each residency review committee as the necessary minimum.*

The most difficult challenges faced by educators are the development and articulation of an educational plan to accomplish their goals. Selective judgment must be exercised in determining the breadth and depth of knowledge students must acquire and the degree of skill they must attain. In clinical medicine, physician-teachers must inculcate appropriate attitudes toward patients and ensure the acquisition by each resident of sound clinical judgment. An educational plan for every specialty should include criteria for determining whether or not residents have attained knowledge and skills as well as appropriate attitudes and judgment. This can be accomplished only if measurable or observable educational objectives are established that can be utilized as criteria to judge residents' progress throughout their education and training. An educational plan and its criteria for evaluation should also ensure that residents progress toward achieving certification by the certifying board.

> *Program directors should be responsible for the development of educational plans that they believe will assure all residents an opportunity to acquire the knowledge, skills, and clinical judgment necessary to prepare them to be proficient practitioners and/or academicians and that will foster attitudes that will lead to continued professional development in their specialty. Pro-*

> *grams should have a periodic intramural evaluation to determine whether or not the educational plans developed by the program directors are being achieved. This intramural evaluation should be conducted by a team including residents, a spectrum of program faculty, and the faculty of interdependent programs in the institution.*

The knowledge, skills, and teaching ability of the faculty are very important determinants of the quality of graduate medical education. Well planned, formal teaching exercises contribute a great deal to the education of residents, but the case method is the foundation of clinical medical education during both the undergraduate and graduate phases. The emphasis on learning by being involved in the care of numerous patients is the principal strength of U.S. medical education. It also has a potential for abuse, particularly in graduate education. Because residents contribute significantly to the care of patients as they learn from each case, the impetus to develop graduate programs and the criteria for determining the number of residents to be in a program may be related more to the service loads of hospitals than to the educational needs of residents.

It is difficult to achieve consensus on the issue of balance between case load and education. The controversial issue of education versus service is discussed more comprehensively in Chapter 6. A key factor in reaching consensus within any institution is the degree of faculty supervision. Supervision of residents by more senior residents and by faculty should ensure that each patient's problems are managed optimally, that residents learn as much as possible from each patient for whom they are responsible, and that they are provided increasing responsibility for patient care as their knowledge and skills increase. This requires both careful planning by the program director and discipline on the part of the faculty. If residents carry a case load in excess of their abilities to learn and if the faculty members are unable to supervise residents effectively, the quality of both graduate education and patient care suffers. It is not possible to derive a case load formula for every specialty that would fit all institutions or programs. The energy, stamina, and intellectual abilities of residents vary, and the supervisory resources available to institutions and programs also vary.

Case loads and time demands need to be examined particularly for junior residents. First-year residents are often expected to carry case loads and hours of duty that stress their mental and physical capacities (12). While there is merit in having young physicians learn that their responsibilities to patients supersede their own personal desires and comfort, the degree to which the traditional demands placed upon junior residents exceed their capacity and may be contrary to good education and training and patient care should be examined. Faculties must be aware of the need to ensure that residents in all programs are carrying case loads consistent with high quality patient care and education.

> *Residents' patient care responsibilities should be organized and scheduled to promote optimal educational opportunities. Supervision by responsible faculty should ensure excellence in the care of patients and permit the faculty to assess each resident's abilities and needs. Patient care demands that exceed residents' abilities to function effectively should particularly be avoided.*

As they progress through their graduate programs, residents should be evaluated periodically to ensure that both they and the faculty are aware of their strengths and weaknesses. Approaches to evaluation will vary, depending upon the specialty and the program emphasis, but should include an assessment of a resident's knowledge, interpersonal skills, clinical judgment, clinical skills, and attitudes. Formal evaluations should occur at least annually. The decision to permit residents to assume a greater level of responsibility for patient care should be dependent upon such evaluations. It is particularly important that residents receive candid feedback, from both formal evaluations and day-to-day interactions with the faculty.

> *Residents should be formally evaluated periodically and apprised of the assessment of their professional development. On the basis of this feedback, the residents' programs should be adapted to their educational needs. Furthermore, with the advice and consent of the faculty, program directors should assume responsibility for attesting to the satisfactory completion of the educational requirements of the program by the residents.*

Graduate programs now often involve several institutions. In a growing number of institutions, a single program may integrate the resources and facilities of two or more institutions. A single program director is in charge of an integrated program and is responsible for its organization and for orchestrating the contributions of a faculty divided among several institutional sites. Administrative integration of programs has been a positive movement toward reducing the fragmentation of graduate medical education. However, just as attention should be paid to ensuring continuity in patient care, attention should be given to ensuring continuity in the graduate education of physicians. Each resident is an individual with unique strengths and weaknesses who must be provided opportunities to acquire the knowledge, skills, attitudes, and clinical judgment required for the practice of a discipline. However, simply providing opportunities is not sufficient. The potential fragmentation inherent in providing a diversity of learning opportunities requires the development of strategies to maintain continuity in evaluating each resident's progress and in tailoring each person's program to meet individual needs. This is a major responsibility for today's program directors who, unlike their predecessors, cannot always develop personal relationships with residents in every educational setting. Since this problem is common to all specialties, institutional attention should be focused on the need for ensuring continuity in graduate education. Minimizing the fragmentation induced by the need for diverse educational opportunities will enhance the quality of graduate medical education even though the one-on-one preceptorial relationships of the past cannot be restored in today's complex medical care and graduate education system.

> *Faculties should develop techniques for the organization of residents' programs that will promote continuity in their educational experience.*

To accomplish the principal goals of graduate medical education, programs must adapt their educational approaches to the needs of each resident. The intellectual abilities and the personal qualities of U.S. medical school graduates are generally high, but variability still exists. It is not sufficient to provide a common and inflexible education paced similarly for all residents. The maximum time permitted to complete a program and the rate of progress through each segment should be geared to the educational attainments and goals of a resident and not based upon externally set minimum time requirements nor upon the service needs of the institution.

> *So long as minimum standards are maintained and to the extent practi-*

cally feasible, program flexibility should be sufficient to accommodate the diversity of residents' abilities and goals in their practice and research careers.

(Conference discussants noted the problems attendant to ensuring flexibility in a rigid system that is particularly constrained by limited resources and by requirements of the various residency review committees and certifying boards.)

Residents, as they progress through their programs, assume an important responsibility for the education of their junior colleagues, medical students, other health professionals, and patients (13). Their effectiveness in accomplishing these responsibilities can be enhanced if their role as educators is specifically considered in planning their programs.

The role residents play as educators should receive particular attention. Their programs should be planned to enhance their ability to teach and to evaluate the performance of students.

The entire graduate medical faculty must be concerned with balancing resources against programs to achieve optimal quality. For all institutions and for every program, achieving the principal goals of graduate medical education must be the basic measure of quality. However, institutional and program missions may vary. For some, the mission may be to prepare a significant number of clinical investigators and academicians. For others, the mission may be to prepare practitioners for a particular state or region. The resources should be sufficient to accomplish both the institutional mission and the principal goals of graduate medical education. Since resources are always finite, graduate faculties should apply rigorous standards in approving the development of new programs or the expansion or change of mission of existing programs.

The number, type, and size of programs in an institution should be tailored so that the available resources will be sufficient to ensure that every program can reasonably be expected to achieve the principal goals of graduate medical education. The program director and ultimately the residency review committee must constantly address numbers and types of faculty, patient volume and mix, and numbers and types of residents that are needed to achieve the balance required for high quality education and patient care.

The acceptance of the goal and the implementation of these recommendations could improve the quality of graduate medical education in the United States without compromising the current national systems for accreditation and certification or impairing the opportunities for program directors, faculties, and institutions to accomplish their goals. Academic medical centers, consisting of medical schools and associated teaching hospitals, are now the principal providers of graduate medical education to essentially all U.S. medical school graduates. This makes it probable that these recommendations will eventually be applied through the continued development of graduate medical faculties with educational values characteristic of the academic tradition of universities. The transition will continue to be evolutionary rather than revolutionary, and the degree to which it extends will be dependent upon the resolution of many complex issues. These include how graduate medical education is to be financed, how it is to be accredited, and how national policies to influence the specialty distribution of physicians evolve.

Conference Discussion†

Dr. Fredric Burg reported for the six conference workshops of 70 individuals who discussed the quality of graduate medical education. While no controversy surrounded the philosophies delineated in this chapter, discussants identified a number of unanswered questions that they felt should be addressed. Dr. Burg summarized them:

The first questions concern institutional accountability.

1. How is the institutional review defined? Is the institution the hospital or the medical school? Does institutional review mean governance, or is this an advisory function?

2. How does one measure the quality of a program? Should it be based on products of the program? Should there be a longitudinal evaluation of the product? Should there be an evaluation of the process of education? What is the importance of a critical mass (*a*) of different programs at an institution, (*b*) of numbers of faculty, and (*c*) of numbers of residents at each level? Who has the responsibility for determining critical masses in an institution, and how should that process be carried out?

3. Given that a process of institutional accountability for quality is recognized, should the function of the institutional activities be monitored by another body? Should guidelines be established for institutional review? Who should evaluate the quality of an institutional review? Is this level of review necessary, or can this be left to self-determination by the institution?

The second area of questions surrounds standards.

1. Should the quality of an institution's program be addressed with regard to minimum standards alone?

2. Is an institution living up to its responsibilities by determining that the residency review committee standards alone are being met?

3. How does one ensure that the standards established by a residency review committee in one discipline are equivalent to the standards of another?

The third area focuses on program evaluation.

1. Should there be more of a role for the clinical, non-geographic full-time faculty in this process?

2. Should faculty members be evaluated in a systematic fashion?

3. Should the learning experience be evaluated, and how can it be evaluated?

4. Should the patient be involved in program evaluation?

5. How should the program be evaluated where there are problems in dealing with the clearly incompetent resident who is not remediable and yet no action is taken?

6. Can there be a better definition of the institution's responsibility?

Three questions relate to resident evaluation.

1. Should senior residents be involved in a systematic evaluation of junior residents?

2. How should the role of residency program directors to attest to successful completion of educational requirements of residency programs be managed in light of institutions awarding concurrent service endurance certificates?

3. Should not more systematic feedback to residents be required regarding their

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† The questions generated in the discussion of this chapter merit the close attention of institutional administrators, program directors, faculty, residency review committees, and the Accreditation Council for Graduate Medical Education as they move toward the implementation of the revised General Requirements section of the "Essentials of Accredited Residencies."

deficiencies (on a regular interval) so that deficiencies can be corrected?

Finally, three other issues were raised.

1. What is the responsibility of the resident to ensuring the quality of a graduate program?

2. Should more emphasis be given to research careers?

3. How does one deal with the problem of a demand for technical competency that requires more exposure per resident, which requires a greater patient load that may result in an inadequate number of residents to handle all the service requirements?

In conclusion, Dr. Burg indicated that a final chapter is needed to define how the task force's report on quality should be used and by whom if it is to have any impact on graduate medical education.

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Chapter 3

The Transition Between Undergraduate And Graduate Medical Education

The need to view medical education as a continuum was well articulated by the Association of American Medical Colleges in 1965 (14). Despite the apparent acceptance of the concept of undergraduate and graduate medical education as a continuum, many students find the transition between the undergraduate and graduate phases difficult. The timely decision by the Council on Medical Education of the American Medical Association to eliminate free-standing internships, coupled with the decision by several specialty boards to permit entrance into programs in their specialties directly after graduation from medical school, has contributed to the confusion. Inadequate information about graduate programs and a limitation in the resources available to teaching hospitals have compounded the problem.

Smoothing the transition by ensuring that sufficient first graduate year positions of high quality are available to meet the needs of graduates from U.S. medical schools, providing adequate information about them, improving counseling, and making the application and selection process less hectic will require concerted action by medical schools, graduate medical education programs, teaching hospitals, and their accrediting bodies. Support for a directed effort to improve the transition must also come from certifying boards and specialty societies. The recommendations that follow can be implemented only if all those involved place a high priority on improving the quality of medical education and show a concern for the needs of students at this critical juncture in their professional education.

Career Counseling

Although the separation of undergraduate from graduate medical education is conventional, most students begin their uninterrupted education and professional development with matriculation into medical school. More particularly, their acquisition of clinical knowledge and skills begins when they have their first contact with patients. In some schools, this may start at matriculation. As an extension of students' clinical education, graduate medical education is directed primarily toward the refinement of clinical and problem-solving skills and the enlargement of clinical knowledge. If both students and faculty recognize and accept this concept of the continuum, development of a more effective career counseling relationship between faculty and students and improved articulation of the undergraduate with the graduate phase will be facilitated.

Most medical schools attempt to provide advisers to entering students. Too often, the role of advisers and the services they are expected to offer to students are not clear to either. Troubled students often seek advice during their early terms when they have academic difficulties, personal crises, or financial problems. Later, as they recognize the myriad career options available to them, all students, formally and informally, begin to ask for assistance in choosing among alternative careers. Finally, as the time for making decisions about graduate medical education programs draws near, students want and need very specific and active counseling advice from knowledgeable faculty and residents.

An important part of the career selection process is the elective final year. During the 1960s, when there was a movement toward shortening medical education and encouraging early career decision-making, most U.S. medical schools abandoned their structured, required final-year curricula and made most or all of the final year elective. This movement toward greater flexibility is generally viewed as a progressive and satisfactory change; however the degree of effective utilization of the opportunities provided by an elective final undergraduate year varies widely among students and among institutions.

(Before effective counseling can take place, the purpose of the final year must be determined. Conference discussants agreed that all M.D.s should be "good physicians or should be broadly educated," but when students would have an opportunity to synthesize their knowledge in the care of individual patients was not clear.)

Students should use the elective final year both to explore their potential interest in and talent for specialties they are considering and to acquire experience in areas to which they are unlikely to gain adequate exposure during their graduate years. Those who approach their final year undecided about career directions should be counseled early to sample areas in which they may have interests so that as the time for decision-making approaches, they may have had opportunities to gain as much insight as possible. Students who are comfortable with chosen career paths should be advised to avoid restricting their elective opportunities to education in the areas they have selected and should be assisted in choosing electives that will maximize their strengths and complement future career development.

All of these demands on a counseling system by medical students and faculty require that the dean assume the leadership in developing a system that provides mechanisms to identify competent faculty advisers, to educate and train them in their various roles, and to ensure that students have easy access to these individuals. Members of the administration and faculty of the medical school should formulate and agree upon sound approaches to advising medical students and disseminating information necessary in their counseling at this stage of their development. Former students and current residents can be helpful in supplying information and counseling students. Some medical schools have successful arrangements with physicians in practice who serve as role models and career counselors to medical students.

Benefits accrue to medical students when administrative officers or other knowledgeable individuals in the dean's office have broad familiarity with and insight into the entire transition process. These persons can provide students with the whole picture of choosing a residency as well as screen students and direct them to the proper resources and advisers. Also, persons with broad knowledge can give students a good general approach to the elective year and can provide guidance for the faculty advisers.

The preparation of advisers to be effective counselors should include (*a*) detailed information about the backgrounds and strengths and weaknesses of those they are to advise; (*b*) guidance regarding the electives that are available and the selection of electives that will complement a student's graduate medical education plans; (*c*) information about the quality of electives offered in other institutions and faculty policies on students' taking electives at other institutions; (*d*) assistance in the assessment of educational trends in their own and related specialties; (*e*) information about national and regional manpower needs in the various specialties; and (f) [illegible]'s about the policies, procedures, and deadlines of the National Resident Matching Program and the options students have in the matching program.

In their counseling roles, advisers should not act as recruiters for their specialties. Rather, they should assess students' talents for their field and transfer to other advisers students they consider unlikely candidates for their specialty.

> (Conference discussants recommended that the AAMC develop a data base by types of fourth-year program opportunities, electives available, and student counseling available and monitor the trends. Discussants were concerned that all too often advisers lack factual information and rely instead on personal preference. One suggested that the AAMC Council of Academic Societies develop a brochure to assist advisers.)

> *Medical schools should develop a cadre of faculty responsible for counseling students regarding their career development and the selection of their first graduate year program. These faculty members should be especially trained to be effective and reliable counselors. Former students and current residents can also be helpful in supplying information and in counseling students.*

> *The Liaison Committee on Medical Education, in its review of schools for accreditation, should place a particular emphasis on the counseling provided to students by the faculty.*

Program Information

One of the strengths of American medical education is that, at the transition between undergraduate and graduate medical education, all students have opportunities to move from one educational setting to another. One of the weaknesses for many students at the transition is the paucity of information about graduate programs available to them. At one time, the American Medical Association regularly published a directory which provided basic data about each program offered. During the 1970s, this directory was published erratically and was never timely for student purposes.

> (Conference discussants pointed out that the recent edition is improved in content and timeliness of publication.)

In 1975 the National Resident Matching Program began publishing its own directory, which it distributes to students about October 1 of each year. Currently, this is primarily a listing of programs plus the number and types of positions offered. The Organization of Student Representatives of the Association of American Medical Colleges has expressed a willingness to participate in expanding the directory information available through the National Resident Matching Program. The American Medical Association staff is also exploring means for the more regular and timely publication of its directory. Two competing directories would not serve students' needs.

> *Working together, the Liaison Committee on Graduate Medical Education,† its sponsoring organizations, and the National Resident Matching Program should publish annually a directory of all programs offering positions to first-year graduates. The directory should contain as much information about the characteristics of the programs as is feasible. It should be available to students no later than October 1 each year.*

A national directory of graduate programs cannot provide students with a subjective evaluation of the educational quality of programs. Subjective impressions can be obtained from recent graduates of a school and made available to students interested in the programs that the recent graduates have completed. The Organization of Student Representatives of the Association of American Medical Colleges has developed a model form for recording information about programs which medical schools could send to their graduates for use in compiling an information file.

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† By ratification of its bylaws by all five parent organizations, the Accreditation Council for Graduate Medical Education officially replaced the Liaison Committee on Graduate Medical Education on January 1, 1981. (See Appendix 1.)

> *Medical schools should regularly canvass their recent graduates to obtain information about their perceptions of the graduate programs they have entered. This information should be made available to students to assist them in making their graduate education plans.*

Application Cycle and Selection

The expanding number of graduates each year from U.S. medical schools and the diversity of first graduate year programs available to students make the development of a workable process of application and selection imperative. The National Resident Matching Program is the foundation upon which an improved process can be developed. Its establishment in 1951 as the National Intern Matching Program was a major step toward easing the pressure on students to make premature decisions. Were the National Resident Matching Program not in place today, the transition would be chaotic.

At present, the vast majority of graduate medical education institutions and their sponsored programs use the National Resident Matching Program and responsibly adhere to its policies and procedures; however, some institutions and programs do not participate. These nonparticipants notoriously set deadlines for application and selection that are not coordinated with the National Resident Matching Program's cycle; thus, they place undue pressure on students to make premature decisions and tempt program directors who are participating in the National Resident Matching Program to petition students for early guarantees of accepting their offers. While only a small number of students encounter such problems, this unsound educational policy should not be tolerated. The quality of a graduate program depends in part upon providing students maximum opportunity to make rational and informed decisions in selecting their specialties and programs. Requiring all accredited programs to utilize the National Resident Matching Program is reasonable and consistent with the purpose of accreditation.

> *All programs in graduate medical education that select immediate graduates of medical schools accredited by the Liaison Committee on Medical Education should be required to utilize the National Resident Matching Program as a condition of accreditation by the Liaison Committee on Graduate Medical Education.*

> (Although some conference discussants did not like this use of the accreditation process, they offered no alternative.)

> *The universal application form being developed by the Association of American Medical Colleges should be used in making selection decisions.‡ Use of the universal application form will not inhibit program directors from obtaining additional information from students in whom they are interested. Directors of residency programs that require additional data, such as biographical sketches, should indicate in their brochures the nature of any sup-*

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‡ Since this recommendation was made, the AAMC Executive Council authorized implementation of the Universal Application Form in the spring of 1981 for students applying to programs for their first graduate year starting in 1982.

plemental information to be sent with applications. The forms should be made available to students at the time they receive the National Resident Matching Program agreement forms and should provide return cards so that their receipt by program directors can be easily verified to students.

Program directors should not request evaluation letters and transcripts from deans' offices and letters of recommendation from faculty until there has been sufficient opportunity for students to be evaluated by the faculty. To ensure that premature evaluations are not requested, program directors should not expect to receive letters and transcripts prior to October 1 of a student's final year unless there is a justifiable and compelling need for an earlier assessment. Adherence to this policy by deans, faculty, program directors, and students will inure to the benefit of all.

The deadline for both students and program directors to make final decisions and submit rank order lists to the National Resident Matching Program should be as close to the first of February as possible. At present, the deadline falls in the second week in January. Extending this deadline by two or three weeks will significantly expand the time available to students and programs for interviews and for decision-making. The Christmas holiday season can be utilized more effectively for interviews, and selection committees will have more time for deliberation after the holidays. The announcement of the match results should be in March, as close to the 15th as feasible.

(Conference discussants recommended that results of the match be available by computer access instead of relying on the U.S. mails. One conference discussant indicated that specialties that experience difficulty recruiting residents will be less eager to see this matching schedule adopted.)

There should be a uniform starting date for all graduate medical education programs, and this date should occur no earlier than June 24. An orientation should be provided to all new residents. It should include (a) an explanation of the mission of the institution and of the goals and objectives of its programs; (b) a review of the expectations for the first-year resident, including the educational program, the teaching of medical students, and the use of the medical record system; and (c) a clear description of the evaluation procedures employed by the institution and the training program.

The application cycle as proposed would follow the calendar outlined below:

May 15—NRMP student agreement forms and uniform application forms available to medical schools for distribution. Institutional agreement forms sent to institutions.

July 1—Institutions return agreement forms to NRMP.

July 30—Students return agreement forms to NRMP.

October 1—*NRMP Directory* distributed to students.

October 1—First date deans' letters and transcripts available from medical schools.

January (as late as feasible)—Students and institutions submit rank order lists to NRMP.

March (as close to 15th as possible)—Match results announced.

June 24 to July 1—Institutional starting time.

Student Visits and Interviews

Policies and procedures for visits and interviews vary. Some institutions and programs accommodate students on an ad hoc basis. Others have highly structured visit and interview systems that require students to appear only by invitation on specified days, usually only after letters and transcripts have been evaluated.

(Conference discussants urged program directors to be more flexible in accommodating students' needs.)

When the opportunities for interviewing for training positions are limited, students may incur both considerable travel expense and inconvenience in reaching the program sites. A survey at one institution in the spring of 1978 bore this out. Eighty-seven senior medical students completed a questionnaire designed to elicit information concerning their experiences in applying and interviewing for residency positions. Fifty-one of these students reported expenditures of $300 or more for transportation, meals, and lodging for visits and interviews. Five reported expenses in excess of $1,000. Only 15 had spent less than $100. It is important that the students be provided as much information as possible during the interviews and that their time and money be conserved.

Publication of scheduled visitation dates early in the application cycle will assist students and schools in planning their final-year academic programs. All institutions and programs are urged to accommodate students whose schedules do not permit adherence to a rigid interview system without undue cost in time and money.

Institutions and programs that adhere to a structured and scheduled procedure should offer a number of dates for visits by students (at least six to 10) spread over several months. If interviews are conducted only after credentials and letters have been reviewed, they should be scheduled only during the 110-day period between October 1 and January 20.

Interviews should be structured so that they not only allow faculty to learn about the students but also provide the students with as much information as possible about the programs. Since residents can make a valuable contribution to the selection process, they should participate in the interviews.

Types of First Graduate Years

Prior to the 1970s, the first year of graduate medical education was called an internship. Only individuals who pursued additional graduate years entered residencies and were called residents. Internships were of two types, straight and rotating. Straight internships were offered principally in internal medicine, pediatrics, surgery, and pathology. Rotating internships were institutionally planned and consisted of a variety of rotations often emphasizing one specialty or another. The specialty boards and residency review committees of all specialties except those that offered straight internships did not permit entrance into training programs directly from medical school, and students entering these specialties first completed straight or rotating internships.

The American Medical Association Citizens Commission on Graduate Medical Education in 1966 recommended (4) that "the internship, as a separate and distinct portion of medical education, be abandoned, and that the internship and residency years be combined into a single period of graduate medical education called a residency and planned as a unified whole."

In the early 1970s, two policy decisions evolved in an attempt to implement this recommendation. First, the Council on Medical Education of the American Medical Association announced that, after 1975, internships (or first graduate years) would no longer be separately approved and that freestanding internships in institutions offering no other graduate medical education would not be permitted. Almost simultaneously, several specialty boards dropped their requirement that individuals complete internships prior to entering their training programs and permitted entry immediately after graduation. Several of these boards required that, either as a part of the first graduate year or interwoven into later years of the program, residents receive education and training in other disciplines.

To accommodate these policy changes, the Council on Medical Education devised three designations for the types of programs to be offered in the first graduate year (15):

> C—CATEGORICAL FIRST YEAR—These are first-year programs, planned, sponsored, and conducted by a single, approved residency program as an integral part of that residency. The content of such a first-year will be limited, generally, to the specialty field of the sponsoring residency program.
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> *—CATEGORICAL* FIRST YEAR—The asterisk designates a first-year program that will be planned, sponsored, and supervised by a single, approved residency as an integral part of that residency. The content need not be limited to the specialty of the sponsoring program but may include experience in two or more specialty fields as determined by the sponsoring program.
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> FLEX—FLEXIBLE FIRST YEAR—The first year will be sponsored by two or more approved residencies and will be jointly planned and supervised by the residencies that sponsor it. Such a first year is designed to give a broad clinical experience for (1) students who feel the need for this type of first year; (2) program directors who feel that such an experience will best serve the purpose of subsequent graduate education in their field; and (3) students who have not yet decided on their specialty but may wish to choose among several fields during their first graduate year. The content of a flexible first year must include four months of internal medicine, but the remainder of the year may be designed in accordance with the purposes of the two or more sponsoring residency programs and the interest and needs of the student.

Experience has now demonstrated significant problems with these designations and the approval and accreditation policies that apply to the Categorical* and Flexible types. The Categorical (C) type of first graduate year presents little difficulty. Residency review committees for each specialty are well acquainted with the educational standards set forth in their Special Requirements and in reviewing the educational plan for programs in their specialty are able easily to assess the first graduate year in the context of the total program.

However, when a residency review committee encounters a Categorical* or Flexible first year type sponsored by a program in its discipline but composed of educational experience in specialties other than its own, it is not comfortable judging the quality of the other specialty offerings. The dilemma is described by John Romano, professor and chairman, Department of Psychiatry, University of Rochester (16): "The assumption that the department of psychiatry would, or could, be in a position to supervise or be responsible for the internship assignment in medicine, pediatrics, neurology, or family medicine in hospital and clinic services at some distance is not only mistaken but patently absurd. When one considers how such an internship could be inspected, examined, or evaluated by review committees, one realizes how impossible is the task. One has only to remember how perfunctory and inadequate is the evaluation of psychiatric residency by the residency review committee."

While it might be assumed that in institutions sponsoring several graduate programs the Categorical* or Flexible types would consist of rotations through approved and accredited programs, such is not necessarily the case. For example, the required experience in internal medicine for a Categorical* psychiatric program may consist of four months' assignment to the medical service of a psychiatric hospital, and a Flexible program cosponsored by anesthesiology and obstetrics can consist of rotations through services in hospitals where there are no other residents.

These designations and their attendant sponsorship and accreditation policies have clearly proved to be unsatisfactory. They tend, in fact, to perpetuate the first graduate year as a separate entity rather than to facilitate the development of a unified residency plan as proposed by the American Medical Association Commission (4).

The problems presented by the current designations and quality control of the first graduate year must be resolved by simplifying the designation system and placing greater responsibility for oversight of quality on both the residency review committees and institutions. The Liaison Committee on Graduate Medical Education has proposed changes that should accomplish this goal.

The Liaison Committee on Graduate Medical Education proposes to merge the Categorical and Categorical* designations into a single designation entitled Categorical:

> CATEGORICAL PROGRAMS: Categorical (C) are programs in a specialty that meet the special requirements of the residency review committee for that specialty. Some specialties require that residents have complementary educational experiences in other disciplines. Whether it is required that such experiences precede or be interwoven into the education and training for the specialty, institutions sponsoring such programs and the program director should make the necessary arrangements for residents to gain these complementary experiences in educational settings that fulfill the special requirements of the residency review committee for such specialties.
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> (Conference discussions revealed that confusion persists about the effect of merging Categorical and Categorical* designations. The asterisk designation has been used to indicate that the content of the first year of a program includes some experience in a specialty field other than that of the sponsoring specialty. Elimination of this designation will not preclude the provision of educational experiences in other specialties by programs. The special requirements for each specialty will determine the conditions that must be met in the design of multispecialty educational experiences.)

Eliminating the Categorical* designation and placing the responsibility for specifying acceptable settings for complementary education on the residency review committees of those specialties that require such experience will allow each residency review committee to specify when and how programs and institutions should provide educational opportunities in clinical disciplines outside the specialty. Some residency review committees may restrict complementary education and training to accredited programs in the other disciplines; other residency review committees may be more permissive and allow the use of nonaccredited settings. If the latter is chosen, it would be desirable for the residency review committee to articulate minimal requirements for these settings.

The Liaison Committee on Graduate Medical Education proposes to change the designation of Flexible programs to Transitional programs.§

> TRANSITIONAL PROGRAMS: Transitional programs are provided for residents who desire in their first graduate year an experience in several specialties prior to embarking on further training in a single specialty. Institutions or consortia of institutions may offer a transitional year provided the following conditions are met:
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> 1. An institutional committee, composed of representatives of the specialties providing training during the transitional

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§ This change was approved by the Accreditation Council for Graduate Medical Education in February 1981 for implementation in 1983.

year, should be responsible for the program development and evaluation.

2. A qualified director should be responsible for operating the program, counseling the residents, and coordinating their evaluation.
3. The year should be spent in an educational setting selected by the institutional committee for the transitional program, in cooperation with two or more accredited programs.
4. In most of their assignments the residents are associated with more senior residents in the participating specialties.
5. The impact of the training in the transitional year should not be deleterious to the quality of training of the residents in the provider disciplines.

The significant change in this proposal is that the responsibility for the development and operation of a first graduate year, consisting of education and training in several disciplines, is placed on the institution rather than upon only two or more programs. In effect this transitional year will be a rotating internship. The important differences from the rotating internship of the past are that there must be (*a*) at least two participating accredited residency programs, (*b*) a designated, qualified director, and (*c*) an institutional committee responsible for program development and evaluation.

> (Conference discussants questioned where the transitional years would be located and how they would be structured. Some worried that transitional programs based in hospitals with large and complex specialty programs would be weak. Others felt that transitional programs in community hospitals would be disadvantaged.)

The new designations and the accreditation policies related to them will allow institutions considerable latitude in meeting the needs of their various sponsored programs. The requirement that transitional programs be limited to institutions that sponsor two or more accredited programs will more effectively ensure that the program is of acceptable quality. The Liaison Committee on Graduate Medical Education should encourage the development of transitional programs in institutions that have accredited programs in internal medicine, pediatrics, surgery, or other broadly-based specialties.

These proposed changes will require modifications of the National Resident Matching Program's matching system. Preliminary discussions indicate that the matching program can be modified to accommodate both Categorical programs and Transitional year programs. The likelihood that either students or programs will be inconvenienced by these changes can be minimized.

Conference Discussion

Dr. Kay Clawson reported for the six conference workshops of 67 individuals who discussed problems attendant to the transition from undergraduate to graduate medical education. Of primary concern in all the groups was preparing individuals with a broad base of medicine to enter specialty training programs. Accomplishing this in the final year of medical school, no matter how it is structured, is not possible for a number of reasons, one of which is that during this year students are away interviewing and assessing training programs. Some felt that the first graduate year should be the transitional, broad year in which students are exposed to a wide range of experiences before they start in specialty training unless they are choosing a broad-based specialty, such as family practice, general internal medicine, and general pediatrics. Finally, rather than focus on any single year, perhaps the emphasis should be on defining how students should perform when they graduate and afford maximum flexibility to the institution to prepare students to enter graduate medical education.

Dr. August Swanson pointed out that, according to 1980 findings, 94.4 percent of the students graduating from medical school enter graduate medical education. From this standpoint, medical students should be prepared to enter graduate medical education, not to enter the practice of medicine. Faculty members should examine undergraduate teaching programs in terms of what they want students to be able to do when they leave medical school and enter graduate medical education.

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Chapter 4

National Standards Formulation and Accreditation

Among Webster's definitions of the word "accredit," several might be said to apply to medical education at both the undergraduate and graduate levels (17):

> To put into a reputable or outstanding category; consider, recognize or acclaim as rightfully possessing an uncontested status; to give official authorization to or approval of; to vouch for officially, to recognize [an educational institution or program] as maintaining standards that render it eligible for membership in an association of similar institutions and that qualify its graduates for admission to higher or more specialized institutions or for professional practice.

In the United States accreditation of institutions or programs in higher education is conducted by a variety of voluntary agencies at both the national and regional levels. In medicine the responsibility for the accreditation of programs of medical education leading to the M.D. degree has, since 1942, been vested in the Liaison Committee on Medical Education, jointly sponsored by the American Medical Association and the Association of American Medical Colleges. This accrediting body is recognized by the U.S. Commissioner of Education in order that accredited medical schools may receive federal funds.

Responsibility for accreditation of programs in graduate medical education has only recently come under the aegis of the Liaison Committee on Graduate Medical Education. Representation in this body is from the American Medical Association, the Association of American Medical Colleges, the American Board of Medical Specialties, the Council of Medical Specialty Societies, and the American Hospital Association. The Liaison Committee on Graduate Medical Education has not sought recognition by the U.S. Commissioner of Education.

Accreditation in graduate medical education is a public trust, and its purposes are many:

1. It assures students who are selecting among programs that the programs have the necessary scope and meet the national standards established for education and training in a particular specialty.
2. It assures the programs' residents, who are the consumers of the educational process, that they are receiving education and training that are of high quality.
3. It assures the medical faculty, staff, and program directors, who jointly are responsible for the educational process, that the enterprise in which they are engaged is of high quality.
4. It assures institutional executives and governing boards that their sponsored programs meet acceptable national standards.
5. It assures certifying boards that the standards they require are being met by individual programs.
6. It assures funding agencies that the educational programs meet national standards and merit support.
7. It protects the public by assuring that the residents are provided education and training of high quality in programs that are well supervised by competent teaching staff.

In order to achieve and retain credibility, accrediting agencies must define and articulate clear standards against which an institution or program can be judged, employ a process that provides methods to determine whether the standards have been met, and be able to demonstrate that decisions to accredit or not to accredit are based solely upon whether the standards have or have not been met.

The system by which graduate medical education is now accredited was devised during the two decades between 1930, when 338 hospitals offered 2,028 residency positions and 5,496 internship positions, and 1950, when 1,079 hospitals offered 19,364 residency positions and 9,370 internship positions (18, 19). The present stress on this system can only be suggested when one considers that in 1976 a total of 1,702 hospitals had 65,046 residency positions in the United States (2).

In this chapter, the history of accreditation in graduate medical education is reviewed, its present status is assessed, and recommendations for its improvement in the future are discussed.

A System To Approve Residencies

In the first quarter of this century, graduate medical education varied from courses of a few weeks' or months' duration to residencies of several years' duration. Professional organizations of specialists did not support the short-course route to specialist status, and, as certifying boards evolved, residency training of several years' duration became the necessary prerequisite to designation as a specialist.

In 1927 the Council on Medical Education and Hospitals of the American Medical Association published a list of hospitals approved for graduate medical education. In 1928 the Council on Medical Education and Hospitals sent forward for approval by the American Medical Association House of Delegates basic standards for residency programs. These were promulgated under the title of *Essentials of Approved Residencies and Fellowships* (20). A regularized system of periodic review and approval by a body specifically designated as having the authority to set standards, to review, and to approve or disapprove hospitals and their training programs was not put in place until much later.

The American College of Surgeons, which from its inception was concerned with the quality of surgical training, began the development of a program to set the standards for surgical education in 1937, and in 1939 it published a list of hospitals in the United States and Canada approved for graduate education. At the same time, the college published a minimum standard entitled, "Fundamental Requirements for Graduate Training in Surgery." From 1937 until 1949 the college and the American Medical Association separately evaluated surgical training programs. A major difference was that the college recognized only programs of three or more years' duration, while the American Medical Association recognized programs that offered shorter periods of training as well. In 1950 the American Medical Association, the American College of Surgeons, and the American Board of Surgery joined together to develop the Conference Committee on Graduate Training in Surgery (20).

Meanwhile, in 1939 the American College of Physicians had begun a similar tripartite effort with the Council on Medical Education and Hospitals and the American Board of Internal Medicine. A conference committee, organized in 1940, began to review hospitals that offered training in internal medicine until World War II interrupted its activities. Plans begun in 1948 to reactivate the conference committee were completed and agreed to by the three participating organizations in 1949 (20).

The fundamental characteristics and operating policies of both the medicine and surgery conference committees were as follows:

1. Members of the committee were appointed by each participant.

2. The committees were given the responsibility to recommend educational standards.

3. Recommended educational standards had to be approved by each participating organization.

4. Decisions to approve or disapprove programs were made by the committees with no further review by the participating organizations.

5. Staffing services were provided by the American Medical Association, with a member of the staff of the Council on Medical Education and Hospitals serving as the secretary to the committee.

6. On-site surveys were conducted by the American Medical Association staff.

In 1953 the term "conference committee" was replaced by the term "residency review committee" (20). This title has persisted.

In 1952 the Council on Medical Education and Hospitals approached the other specialty boards and proposed establishing residency review committees to set their educational standards and review their training programs (20). By 1956 committees had been established in all the specialties except pathology, obstetrics-gynecology, and thoracic surgery (20). Their policies and modes of operation were similar to those that had evolved for medicine and surgery. Except for the surgical specialties and internal medicine, sponsorship of these residency review committees was limited to the American Medical Association and the specialty board. There were no sponsors from a specialty society.

At present, the sponsorship of residency review committees is still variable, with some having tripartite sponsorship and some bipartite. Organizations sponsoring residency review committees are shown in Table 4.1. The latest specialty to be designated, emergency medicine, is presently organizing a residency review committee. Its sponsorship has not been determined.

By 1970 the residency review committee system, staffed by the American Medical Association, was responsible for setting the standards and for reviewing and approving programs in graduate medical education in all specialties except pathology. The American Board of Pathology continued independently setting standards for and reviewing residencies in pathology until 1972, when it also joined the system.

In the late 1960s, as the federal government began to scrutinize graduate medical education and federal support for graduate medical education was foreseen as a distinct possibility, the American Medical Association explored the possibility that the U.S. Office of Education might recognize the residency review committee system as the accrediting agency for graduate medical education programs. The Office of Education indicated that recognition would be denied, principally because of the narrow representation on the residency review committees and their singular dominance by the American Medical Association. Stimulated by this criticism, the American Medical Association began discussions with other organizations that had a genuine interest in graduate medical education.

In 1972 the American Medical Association, the Association of American Medical Colleges, the American Board of Medical Specialties, the Council of Medical Specialty Societies, and the American Hospital Association established a pentapartite committee to be responsible for the accreditation of graduate medical education. It was agreed that, as a first order of business, this accreditation committee, the Liaison Committee on Graduate Medical Education, would seek official recognition by the U.S. Office of Education.

The five parent organizations of the Liaison Committee on Graduate Medical

TABLE 4.1

Organizations Sponsoring 22 Residency Review Committees, 1978–79

Residency Review Committees	Sponsoring Organizations
Allergy & Immunology	American Board of Allergy & Immunology (A Conjoint Board of the American Boards of Internal Medicine and Pediatrics) AMA Council on Medical Education
Anesthesiology	American Board of Anesthesiology AMA Council on Medical Education
Colon & Rectal Surgery	American Board of Colon & Rectal Surgery AMA Council on Medical Education American College of Surgeons
Dermatology	American Board of Dermatology AMA Council on Medical Education
Family Practice	American Board of Family Practice AMA Council on Medical Education American Academy of Family Physicians
Internal Medicine	American Board of Internal Medicine AMA Council on Medical Education American College of Physicians
Neurological Surgery	American Board of Neurological Surgery AMA Council on Medical Education American College of Surgeons
Nuclear Medicine	American Board of Nuclear Medicine (A Conjoint Board of the American Boards of Internal Medicine, Pathology, and Radiology, and also sponsored by the Society of Nuclear Medicine) AMA Council on Medical Education
Obstetrics-Gynecology	American Board of Obstetrics & Gynecology AMA Council on Medical Education American College of Obstetricians and Gynecologists
Ophthalmology	American Board of Ophthalmology AMA Council on Medical Education American Academy of Ophthalmology
Orthopaedic Surgery	American Board of Orthopaedic Surgery AMA Council on Medical Education American Academy of Orthopaedic Surgeons
Otolaryngology	American Board of Otolaryngology AMA Council on Medical Education American College of Surgeons
Pathology	American Board of Pathology AMA Council on Medical Education
Pediatrics	American Board of Pediatrics AMA Council on Medical Education American Academy of Pediatrics
Physical Medicine & Rehabilitation	American Board of Physical Medicine & Rehabilitation AMA Council on Medical Education
Plastic Surgery	American Board of Plastic Surgery AMA Council on Medical Education American College of Surgeons

TABLE 4.1 (Continued)

Residency Review Committees	Sponsoring Organizations
Preventive Medicine	American Board of Preventive Medicine AMA Council on Medical Education
Psychiatry & Neurology	American Board of Psychiatry & Neurology AMA Council on Medical Education
Radiology	American Board of Radiology AMA Council on Medical Education
Surgery	American Board of Surgery AMA Council on Medical Education American College of Surgeons
Thoracic Surgery	American Board of Thoracic Surgery AMA Council on Medical Education American College of Surgeons
Urology	American Board of Urology AMA Council on Medical Education American College of Surgeons

SOURCE: American Board of Medical Specialties. *Annual Report, 1977–78.* Evanston, Illinois: American Board of Medical Specialties, 1978.

Education also agreed to establish another group to be called the Coordinating Council on Medical Education.* The role of the Coordinating Council on Medical Education was to approve major policies not only of the Liaison Committee on Graduate Medical Education but also of the Liaison Committee on Medical Education, which had been accrediting undergraduate medical education since 1942. The Coordinating Council on Medical Education was also charged to form a liaison committee to accredit continuing medical education. The Liaison Committee on Continuing Medical Education, which was established in 1977, has only four sponsors since the American Medical Association withdrew as a sponsor in 1979.

Liaison Committee on GME

In the establishment of the Liaison Committee on Graduate Medical Education and the Coordinating Council on Medical Education, the parent organizations first reached five points of agreement:

> 1. As soon as possible, there will be established a Liaison Committee on Graduate Medical Education, with representation from each of the five organizations, to serve as the official accrediting body for graduate medical education.
>
> 2. Simultaneously, there will be established a Coordinating Council on Medical Education composed of representatives from each of the five organizations to consider policy matters for both undergraduate and graduate medical education for referral to the parent organizations.
>
> 3. The existing Liaison Committee on Medical Education and the new Liaison Committee on Graduate Medical Education will have the authority to make decisions on accreditation in their respective areas within the limits of policies established by the parent organizations and with the understanding that Residency Review Committees will continue to function.
>
> 4. All policy decisions will continue to be subject to approval by the parent organizations.
>
> 5. Policy recommendations may originate from any of the parent organizations or from the two liaison committees, but

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* Effective January 1, 1981, the Liaison Committee on Graduate Medical Education was reorganized and transformed into the Accreditation Council for Graduate Medical Education under the auspices of the same sponsoring organizations. Details of the reorganization are set forth in Appendix 1.

> will be subject to review by the Coordinating Council before final action is taken by the parent organizations.

Subsequently, representatives of the five parent organizations met and agreed on a proposal for the Liaison Committee on Graduate Medical Education. The purpose and function of the Liaison Committee on Graduate Medical Education were specified in a proposal and agreed to and approved by the five parent organizations.

> PURPOSE
>
> A. To consolidate existing multiple accrediting activities in graduate medical education under a single accrediting agency qualified for recognition by the U.S. Commissioner of Education.
>
> B. To establish a body for supervision and accreditation of graduate medical education comparable to that existing for undergraduate medical education.
>
> FUNCTION
>
> A. To accredit programs of graduate medical education recommended for approval by residency review committees.
>
> B. To coordinate the development of improved review and evaluation procedures of residency review committees.
>
> C. To establish more effective central administrative procedures for the conduct of accreditation in graduate medical education.
>
> D. To develop and propose to the Coordinating Council on Medical Education policies and methods whereby graduate education programs in the various specialties may be related more closely to each other and to the total educational enterprises in their individual institutions.
>
> E. To recommend studies directed toward improvement in the standards for organization and conduct of programs in graduate medical education.

The points of agreement and the expressed "Purpose and Function" indicate that all participants to the agreement that formed the Liaison Committee on Graduate Medical Education recognized the need to consolidate responsibility for accreditation of graduate medical education in one committee; and that committee was charged to improve the review and evaluation procedures and attain sufficient credibility as an accrediting agency so as to be recognized by the U.S. Office of Education. The stipulation in Point 3 that the residency review committees should continue to function and the requirement that policies established by the Liaison Committee on Graduate Medical Education would have to be approved by the Coordinating Council on Medical Education and each of its parent organizations indicates that it was not intended that the Liaison Committee on Graduate Medical Education be granted exclusive domain over the accreditation of graduate medical education.

The first organizational meeting of the Liaison Committee on Graduate Medical Education was held on December 18 and 19, 1972. In accordance with the articles of the proposal for its establishment, an annual rotation for the chairman was established with each parent organization appointing the chairman in turn. The staff to the Council on Medical Education of the American Medical Association was designated to provide staff support to the committee for the time being. In subsequent meetings a financing plan was developed and approved by the parent organizations. This plan stipulated that the American Medical Association defray one-half the cost of all accreditation activities conducted by the Liaison Committee on Graduate Medical Education and the residency review committees, that programs be charged for periodic review to generate revenue to support the evaluation process, and that costs not covered by these revenues be distributed among the five parent organizations. When its bylaws were approved by the Coordinating Council on Medical Education and its parent organizations in 1975, the Liaison Committee on

Graduate Medical Education began officially to accredit programs in graduate medical education.

According to the mode of operation established, residency review committees would continue to review programs in their specialties and recommend to the Liaison Committee on Graduate Medical Education whether programs should be accredited, not be accredited, or be placed on probation. The Liaison Committee on Graduate Medical Education, after reviewing the documentation of each residency review committee decision, would then issue a letter advising the director of the accreditation status of the program.

When the Liaison Committee on Graduate Medical Education began examining the procedures and records of each residency review committee, it became apparent that, although the Council on Medical Education was represented on each residency review committee and staff support to each residency review committee was provided by the American Medical Association, residency review committee policies and procedures were inconsistent, and communication among residency review committees was essentially nonexistent. Instances in which programs had been on probation year after year were found frequently, and it was not uncommon to find several programs in the same hospital on probation simultaneously. These inconsistencies in policy and procedures and organizational isolation among the residency review committees were considered to be important areas on which the Liaison Committee on Graduate Medical Education should exert its first efforts in accomplishing its purpose and function. Of equal or greater concern to the Liaison Committee on Graduate Medical Education was the finding that the documentation of the reasons for residency review committee approval or disapproval of a program was frequently lacking or that the written record often supported a decision opposite to that recommended by a residency review committee.

A manual of "Structures and Functions" setting forth policies and procedures to be followed by all residency review committees was developed. These included policies related to the type of accreditation status that could be designated. Particular emphasis was placed on probationary status, which was limited to four years with a review required after a program had been on probation for two years. A policy was established that the accreditation status of programs, including probation, was public information, and the staff was directed to inform deans of medical schools of the accreditation status of programs in hospitals affiliated with the school. The residency review committees were asked to state their reasons for making a decision in the record of their meetings and provide this record to the Liaison Committee on Graduate Medical Education.

These actions and others by the Liaison Committee on Graduate Medical Education were not well received initially by the residency review committees. Accustomed to operating independently, each with its own approaches to review and evaluation, the residency review committees viewed the Liaison Committee on Graduate Medical Education as an alien group, superimposed upon them.

In an effort to improve communications and understanding, residency review committee chairmen initially were invited to attend the sessions of the Liaison Committee on Graduate Medical Education meetings during which their committee actions were to be reviewed, and later an annual meeting of all residency review committee chairmen was organized for the purpose of discussing policy development.

These meetings with the chairmen revealed that they were also concerned about the quality of information that they had available and were particularly frustrated by the unreliable survey reports that the field staff supplied.

Early in the operation it was apparent that the Liaison Committee on Graduate Medical Education was extremely dependent on the staff to carry out its purpose and function. Experience demonstrated that the American Medical Association staff was not singularly dedicated to the Liaison Committee on Graduate Medical Education and dealt with its needs as tasks added to their other responsibilities to their employer. In 1976 discussions to improve staff support were begun within the Liaison Committee on Graduate Medical Education, and in 1977, after the Association of American Medical Colleges, the American Board of Medical Specialties, and the Council of Medical Specialty Societies issued resolutions calling for staffing of the Liaison Committee on Graduate Medical Education independent of any other parent organization, the Liaison Committee on Graduate Medical Education asked that the parent organizations appoint a commission to investigate the staffing problem and to recommend change.

The Past Linked to the Future

The development of a system to approve residencies began in an era when graduate medical education for most graduates of U.S. medical schools consisted of a one-year rotating internship. Hospitals offering residency programs were few, and the number of residents was small.

As can be seen in Appendix 2, graduate education has grown enormously in both the number of hospitals participating and the number of positions offered. Graduating medical students now expect to be residents for three or more years after graduation, and, in 1979, 93.2 percent of the U.S. graduating class responding to a survey conducted by the Association of American Medical Colleges indicated that they expect to seek certification by a specialty board (8).

Medical education has become a two-phased process: the first phase prepares students for graduate medical education, and the second phase prepares students for independent practice and certification by a specialty board. Because of these changes, the accreditation of graduate medical education is significantly more complicated and more difficult to do well than it was when only a fraction of U.S. physicians sought specialty training in a small number of hospitals.

However, the accreditation system which is operating now is based upon two principles that evolved between 1930 and 1950 (20): residency review committees should be composed exclusively of individuals in the same specialty, and the graduate program is the educational unit to be approved.

Although the standards for training programs in each specialty, as set forth in the Special Requirements section of the "Essentials of Accredited Residencies," are reviewed and approved by the Council on Medical Education, in its capacity as the sponsor of each residency review committee, and by the Liaison Committee on Graduate Medical Education, they are conceptualized in isolation from educators in the other specialties (21). The Liaison Committee on Graduate Medical Education has recently required that proposed changes in the Special Requirements be accompanied by a statement regarding the impact that these modifications will have on other disciplines and institutional resources. This is a beginning toward achieving the goal of having the various specialties recognize their interdependence.

An analysis of the information requested from programs in the process of being reviewed for accreditation demonstrates that most residency review committees pay little attention to the total educational environment in which programs reside (see Appendix 13). Only four ask whether or not there are other graduate programs in the institution, and only two of these ask about the accreditation status of the other programs. This isolation of the residency review committees from meaningful contact with other specialties and their singular focus on program accreditation without regard to the total educational setting must be viewed as a heritage of the early era of graduate medical education evaluation and approval when there were few programs and a small number of residents. For the future, an accreditation system must be developed consistent with "Function D" as specified in the articles of agreement for the Liaison Committee on Graduate Medical Education: "To develop and propose to the Coordinating Council on Medical Education policies and methods whereby graduate education programs in the various specialties may be related more closely to each other and to the total educational enterprises in their individual institutions."

Improving Accreditation

Changes in the accreditation of graduate medical education should be based on the following recommendations:

> *The purposes of graduate medical education accreditation should be (a) to establish current standards that will ensure acceptable educational quality and (b) to enhance progressively the level of quality of graduate medical education in the United States.*

Accreditation, by setting standards that must be met, achieves its major purpose of ensuring that programs are of acceptable quality while concomitantly ensuring that an acceptable level of patient care is maintained. It thereby protects the interests of students, residents, institutions and their faculties and staff, certifying boards, supporting agencies, and the public. Through constant attention to ensuring that standards are consistent with the changing educational needs of residents and by constantly reexamining the policies and procedures for review and approval of programs, the residency review committees and the Liaison Committee on Graduate Medical Education should, in the future, make accreditation play a significant role in the progressive improvement of all aspects of graduate medical education.

> *Programs in graduate medical education should continue to be reviewed and approved by residency review committees and accredited by the Liaison Committee on Graduate Medical Education.*
>
> (Conference discussants considered this recommendation in light of the announced intention to allow residency review committees a role of delegated autonomous authority in this process. It was felt that most residency review committees would move promptly to seek autonomy and that an early need would be for a clear statement of policy describing the criteria for granting such autonomy, the methods of monitoring performance, and the performance and the procedures necessary for considering a reversal of this process.)

Residency review committees have two functions. They develop the standards (Special Requirements) that programs must meet to achieve accreditation, and they review and judge whether programs that seek approval for accreditation have met these standards.

The Liaison Committee on Graduate Medical Education should continue to approve the Special Requirements, review residency review committee actions, and accredit programs.

> *A specialty board should not be the sole sponsor of a residency review commit-*

tee, nor should a professional organization with direct representation on the Liaison Committee on Graduate Medical Education be a sponsor.

(Conference discussants accepted the first part of this recommendation, but the second part, "nor should a professional organization with direct representation on the Liaison Committee on Graduate Medical Education be a sponsor," stimulated extended discussion with divergent opinions. Representatives from two disciplines supported the recommendation as written. There was a general perception that the present two-level role of the American Medical Association as a residency review committee sponsor and as a parent of the Liaison Committee on Graduate Medical Education represented an asymmetry in the organization of the accreditation process in graduate medical education. Some felt that most residency review committees would be extremely reluctant to relinquish or to alter the American Medical Association sponsorship. Several strongly defended the record of the American Medical Association and urged continuation of the present alignment.)

As shown in Table 4.1, residency review committees have a bipartite or tripartite sponsorship. A specialty board and the American Medical Association are sponsors of each of the 22 residency review committees. In 14 cases a major national professional specialty society is also a sponsor. Because of its sponsorship and supervision of each residency review committee and its direct representation on the Liaison Committee on Graduate Medical Education, the American Medical Association has the power to influence accreditation policies at two levels. First, in its capacity as sponsor, it acts to approve or disapprove each residency review committee's Special Requirements, and then it participates in approval or disapproval of the Special Requirements by the Liaison Committee on Graduate Medical Education. The American Medical Association should continue as a parent organization of the Liaison Committee on Graduate Medical Education but should relinquish its sponsorship of the residency review committees. Specialty boards not presently having a national professional specialty society as a cosponsor of the residency review committee for their specialty programs should seek such a cosponsorship. The cosponsoring society's membership should permit an enhanced representation from medical education as well as from physicians practicing the specialty.

Each residency review committee should be composed primarily of individuals who are specialists in the discipline and educators.

(Some conference discussants felt the word "educators" should be defined.)

The practice of having a residency review committee for each specialty composed of specialists in that clinical discipline who are also involved in education is basically sound.

The Liaison Committee on Graduate Medical Education should be composed of an equal number of representatives from each of its parent organizations. The selected representatives should have significant involvement in graduate medical education. Public membership should be expanded.†

The current and proposed representation in the Liaison Committee on Graduate Medical Education appears in Table 4.2.

The Liaison Committee on Graduate Medical Education membership should be increased in order to provide equal representation from all five parent organizations. A total membership of 20 representatives from the parent organizations, plus two public members, a resident member,

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† The proposed revision of the accreditation system will accomplish most of this recommendation. See Table 4.2.

TABLE 4.2

Liaison Committee on Graduate Medical Education Membership

Representation From	Number of Representatives	
	Current	Proposed*
Association of American Medical Colleges	4	4
American Board of Medical Specialties	4	4
American Medical Association	4	4
American Hospital Association	2	4
Council of Medical Specialty Societies	2	4
Federal Government (Department of Health and Human Services)	1	1
Public	1	2
Resident	1	1
Total	19	24

* In this column is shown the number of representatives proposed by the Association of American Medical Colleges. The reorganization of the Liaison Committee on Graduate Medical Education, which resulted in the establishment of the Accreditation Council for Graduate Medical Education, provided for the proposed representation except that there is only one public member and the federal member is nonvoting.

and a federal member would provide the diverse representation that is needed.

At present the chairmanship of the Liaison Committee on Graduate Medical Education is rotated among the five parent organizations annually. Each organization, in turn, designates which of its representatives will be chairman. Annual changes in leadership inhibit continuity of policy and program development. Designation of the chairman by the parent organizations denies the Liaison Committee on Graduate Medical Education the opportunity to select from among its members the individual who has demonstrated interest and the greatest talent for leadership. The chairman of the Liaison Committee on Graduate Medical Education should be selected by its membership. The Liaison Committee on Graduate Medical Education should recommend to its parent organizations the length of the term to be established for the chairmanship.

The Liaison Committee on Graduate Medical Education and residency review committees should have a single, capable professional staff of sufficient size. The staff should be solely dedicated to the Liaison Committee on Graduate Medical Education and the residency review committees and be responsible to no other agency or organization.

(This recommendation was discussed in light of reports of greatly improved staff function in recent months, in light of the search for a new secretary, and in light of the announced intention of the American Medical Association to review the functions of the staff after 18 months. Because of these rather unexpected events, it was generally felt that the possible development of an independent staff should remain on the record rather than be a recommendation for action at present.)

The growth in size and complexity of graduate medical education has reached the point that its effective accreditation requires a competent and skilled full-time staff. In the future, a staff selected by the Liaison Committee on Graduate Medical Education and dedicated solely to serve its needs and those of the residency review committees should be organized to manage the accreditation process and to implement policies. The physical location of the staff and the facilities for conducting this activity should promote cohesion among its members and facilitate interaction among the staff and the Liaison Committee on Graduate Medical Education and residency review committee representatives. The staff director should report to the chairman of the Liaison Committee on Graduate Medical Education. The director should be an individual with a depth of experience in medical education, capable of managing the personnel and financial affairs of the organization, and qualified to assist the leadership in the continued improvement of the accreditation system and process.

An executive committee composed of one representative designated by each of the five parent organizations should be established to assist the chairman in the conduct of Liaison Committee on Graduate Medical Education business.

> *Direct communication between residency review committees and the Liaison Committee on Graduate Medical Education should be continued and expanded.*

> (Conference discussants unanimously supported this recommendation. In the proposed reorganization, chairmen of residency review committees will have regular access to the agenda of the Accreditation Council for Graduate Medical Education. Their views can, therefore, be considered at the meetings.)

The practice of having residency review committee chairmen attend the Liaison Committee on Graduate Medical Education meetings when the actions of their committees are reviewed should be continued, and the annual meeting of the residency review committee chairmen with the Liaison Committee on Graduate Medical Education should be continued and expanded in content. This meeting should be used to catalyze the studies directed toward improvement in the standards for organization and conduct of programs in graduate medical education which are required in "Function E" of the Liaison Committee on Graduate Medical Education. Residency review committee chairmen, assisted by the professional staff, should have a major responsibility to inform their committee members of the general issues and problems in the accreditation of graduate medical education and interpret Liaison Committee on Graduate Medical Education policies both to the members and to their participating organizations.

> *Assessment of the overall educational setting should receive greater attention in evaluating programs in the future than it has in the past.*

In developing or modifying their Special Requirements in the past, residency review committees have not consulted sufficiently with other residency review committees or with other specialists whose educational programs complement or support their own. When a residency review committee begins planning to change its Special Requirements, early consultation should be sought with other disciplines. One mechanism would be to establish a subcommittee composed of residency review committee members and selected consultants from other disciplines.

The amount of information available to residency review committees about the characteristics of the institutions sponsoring programs being reviewed by each residency review committee should be increased and the quality of the information should be improved. The Liaison Committee on Graduate Medical Education and the residency review committees should become better informed about the relationship between institutional characteristics and program quality.

> *The formulation of the Special Requirements developed by the residency review committees should be based on clearly stated educational criteria. These should focus on the total edu-*

cational setting, as well as on the specific requirements for each clinical discipline. Insofar as possible, the Special Requirements should follow a common format.

As presently published in the "Essentials of Accredited Residencies," both the General and Special Requirements are so general and vague that it is difficult to measure whether or not an institution or program is in compliance with the standards (22). Some residency review committees have published "guides" that are alleged to be only advisory but that often appear to contain criteria that go beyond the published requirements. Special Requirements vary in their organizational format and degree of specificity. All residency review committees should rewrite their Special Requirements using a common format.

(While conference discussants generally supported the suggestion that Special Requirements use a common format, the suggested guidelines were considered as being too detailed and as emphasizing process over the evaluation of quality. The Liaison Committee on Graduate Medical Education had modified the guidelines and had distributed them to the residency review committees as a suggested format.)

The following are some suggested topics to be addressed by residency review committees in developing Special Requirements:

Description of position of program director—Length of appointment; responsibilities such as evaluations, conferences, and rounds; time to be devoted to responsibilities, that is, full-time or part-time; and qualifications such as board certification, experience in teaching residents, and professional activities.

Qualifications for teaching staff—Board certification or eligibility; teaching experience; research experience; and special patient care experience.

Guidelines for supervision of residents—Faculty/resident ratio necessary for residency; guidelines for supervision of procedures; and guidelines for residents writing orders.

Program requirements—Previous education necessary for residents entering program; length of residency; other graduate programs that must be present; rotations on other services; length of time on other services; ambulatory clinical experiences; rotation in special units; laboratory experiences; basic science education; competence in certain diagnostic procedures; mix of patients; educational conferences, educational advisory committee; research; and publications.

Description of resident responsibilities—Keeping patient logs or operation record; patient care; and teaching medical students or junior residents.

Requirements for an evaluation system—Appropriate intervals for evaluating resident performance; guidelines for providing graduated responsibility; record-keeping system for resident evaluations; in-training examinations; evaluations that must be provided by the program director to the specialty board; and process for dealing with residents who do not meet minimum standards.

Guidelines for affiliation with other institutions—Medical school affiliation; integrated or affiliated programs; and rotations in other settings.

Facilities—Laboratories; office space; library; on-call rooms; and equipment.

In this endeavor, each residency review committee should seek to be sufficiently specific so that the criteria that programs must meet in the aggregate are clear and assessable, but it should avoid being so narrowly specific that a program might be disqualified for failing to meet every criterion precisely. Special Requirements should not force all programs into a common mold, nor should they inhibit responsible innovation. In instances where residency review committees are contemplating Special Requirements that will place demands on other disciplines, early consultation should be sought from knowledgeable individuals within the affected disciplines.

Site surveys of an institution's programs should be conducted by teams composed of knowledgeable physician specialists who are involved in medical education, assisted by a professional staff capable of collating and systematically organizing information.

(This recommendation was made at a time when the field surveys had become inadequate, staff support disorganized, and the system in a state of near breakdown. Discussions from many sources revealed a turnaround in performance. Job descriptions for surveyors have been changed, training programs have been started, and from a number of disciplines there is support and even enthusiasm for the new level of field surveyor function. In this context, many discussing this recommendation felt that the justification for a new system of team site visitors is no longer present, that it would be prohibitive from a cost standpoint, and that team quality would be difficult to sustain. The extent of support for this recommendation, therefore, was limited to the suggestion that it might be tried as a pilot project and the results studied. It was felt that, in any event, team surveys would not be applicable to all settings.)

Site surveys are presently conducted either by field staff or by specialist site visitors. The field staff surveyors are essentially responsible only for verifying whether or not the information provided by a program is accurate. Specialist site visitors are assigned to survey a program when a residency review committee is concerned about a program's inability to comply with its standards. In the case of the American Medical Association's field staff survey, little reliable information is gained regarding the actual quality of the education being provided to residents. Specialist site visitors provide more reliable insights into the subtleties of the strengths and weaknesses of a program. In neither case does the residency review committee gain an appreciation of the total educational environment being provided by the sponsoring institution.

In the future, the itinerant field surveyor system should be abandoned. The predominant mode should be that teams of knowledgeable specialists involved in medical education should make periodic surveys of all of the programs in an institution or in a manageable geographic area. Teams should be composed of those specialists best suited to evaluate the constellation of programs to be reviewed. Institutions should be consulted in advance regarding whether or not there is need for special attention to specific programs. The survey visitors should be assisted by a professional staff who are capable of collating and systematically organizing information. Individual specialist site visitors should be used when a team visit is not practicable.

The purpose of team surveys is to improve the review process by improving the quality and increasing the quantity of information available to residency review committees and the Liaison Committee on Graduate Medical Education. It is not intended that the reviewers recommend accreditation of an institution in lieu of approval of each specialty program by the respective residency review committee. Reports should be prepared by the professional staff, reviewed and approved by the team chairman, and provided to each residency review committee responsible for approving a program sponsored by the institution. The report should include an assessment of the institution's compliance with the General Requirements, as well as an assessment of compliance with the residency review committee's Special Requirements.

Data collection and program review by residency review committees should focus on determining whether the General and Special Requirements have been met. Only criteria and concepts published in the General and Special Requirements should be utilized in determining a program's compliance with the standards set forth.

At present, each residency review committee is utilizing pre-survey data collection forms that were developed years ago and that have been modified at irregular intervals. The data requested may or may not have an identifiable relationship to a residency review committee's Special Requirements. No data collection instrument is directed toward determining whether sponsors of graduate programs are in compliance with the General Requirements. In the future, data forms should be changed to reflect modifications in the General and Special Requirements. Required information should be that needed to determine whether a program is in compliance with the standards set forth in the Special Requirements and whether the program's sponsor is in compliance with the General Requirements. The Liaison Committee on Graduate Medical Education should collect uniformly and provide to each residency review committee data related to the General Requirements and data of common utility to all residency review committees.

The frequency of review and approval of programs should be determined by their need for modification and improvements. Sound programs in supportive educational settings should be reviewed relatively infrequently as compared to new programs or programs with deficiencies requiring correction.

For many years the period for survey of graduate medical education programs was set at three years. Recently, the period has been extended to four years. The performance history of a program or institution has not been considered significantly in determining the frequency of survey and review by a residency review committee, although programs considered to be in serious difficulty or on probation are surveyed at more frequent intervals at the request of residency review committees. In the future, using the team system described above, surveys of all the programs sponsored by an institution should be conducted with a periodicity of six or more years. Specific programs found to be in difficulty at the time of a team survey should be required to submit progress reports that delineate ways in which deficiencies are being rectified, and, as necessary, the programs should be surveyed on an interim basis by a specialist site visitor who is charged with the responsibility of reporting on the program's progress. In unusual circumstances, when an entire institutional complex of programs is considered marginal, an interim team survey should be scheduled. A system for evaluating interim reports and for alerting residency review committees to significant changes in a program should be developed.

Necessary changes in both the General and Special Requirements of the "Essentials of Accredited Residencies in Graduate Medical Education" should be accomplished expeditiously through the clear definition of the role, responsibility, and authority of the residency review committees, the sponsors of residency review committees, the Liaison Committee on Graduate Medical Ed-

ucation, the Coordinating Council on Medical Education, and its parent organizations. Procedures should be developed to resolve disputes and differences so that needed changes will not be inhibited or inordinately delayed.

(Under the proposed plans for reorganization, some of the old problems are likely to disappear, while time will be required to identify the agenda of difficulty under the new alignment. One specific suggestion that came out of conference discussion groups was that definitive time frames of response be required on policy issues for sponsors of residency review committees. This would be consistent with the announced changes for the parent body and the Accreditation Council for Graduate Medical Education.)

The standards for accreditation of programs in graduate medical education must be changed periodically in order to keep pace with the growth in biomedical knowledge and technology and the evolution of educational procedures and policies. Timely modifications in the General and Special Requirements have been difficult to accomplish because gaining the approval of all organizations involved has required so much time and effort.

From their inception, the residency review committees and the Liaison Committee on Graduate Medical Education have had the responsibility to consider recommendations for changes in the standards for graduate medical education and to draft revisions of the "Requirements" which are then referred to their sponsoring organizations. This role should be continued.

The sponsoring organizations of the residency review committees should continue to have the authority to approve revisions of their Special Requirements, and the parent organizations of the Liaison Committee on Graduate Medical Education should continue to have the authority to approve the revisions of the General Requirements. Procedures should be developed that will ensure a review of proposed revisions on a reasonable schedule.

There should also be a means to resolve disputes. Procedures for settling disputes should provide for increased communication among the organizations and the participation of their key representatives in direct debate.

For revisions in the Special Requirements, the residency review committees should be the forum in which the sponsoring organizations come together to consider differences and effect compromises so that approved changes may be forwarded to the Liaison Committee on Graduate Medical Education for final approval. The Liaison Committee on Graduate Medical Education should base its judgment of changes in Special Requirements on their conformity to the General Requirements and their impact on the broad interests of graduate medical education.

For revisions in the General Requirements, the Coordinating Council on Medical Education should be the forum in which differences among the five parent organizations of the Liaison Committee on Graduate Medical Education are resolved.

The cost for review and evaluation should be borne principally by the programs and their sponsoring institutions. Collateral costs of the Liaison Committee on Graduate Medical Education and residency review committees should be borne equally by the parent organizations of the Liaison Committee on Graduate Medical Education.

The source of financial support for accrediting agencies varies. In medicine, the costs of accreditation traditionally have been borne by national professional organizations. Until the formation of the Liaison Committee on Graduate Medical Education, the American Medical Association underwrote essentially all of the costs of the accreditation of graduate medical education, and the American Medical Association and the Association of American Medical Colleges continue to bear the costs of the medical school accreditation activities of the Liaison Committee on Medical Education. At present, the American Medical Association pays one-half of the costs generated by the Liaison Committee on Graduate Medical Education and the residency review committees in their review, approval, and accreditation activities. Revenues derived from charges to programs for surveys and residency review committee reviews provide a substantial amount toward the remaining one-half of costs, and the five parent organizations share the balance equally.

In the future, no single parent organization should bear a disproportionate share of the cost of graduate medical education accreditation. Costs should be recovered primarily from revenue generated through charges to programs and institutions. Costs to the parent organizations should be limited to those necessary to support their representative's attendance at scheduled meetings of the Liaison Committee on Graduate Medical Education. The graduate medical education system in the United States is complex, and it involves a diversity of programs and institutions which differ in size and in the demands they place on the accreditation system. An equitable formula of charges should be developed that takes into account this diversity.

Conference Discussion

Dr. Gordon Douglas reported for the six conference workshops of 109 individuals who discussed national standards formulation and accreditation. Observations from these groups are presented throughout this chapter.

Working Group on National Standards Formulation and Accreditation of Graduate Medical Education

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Chapter 5

Specialty Distribution And Graduate Medical Education

Specialization in medicine has paralleled the growth of specialization in all fields. Specialized and limited occupations are now commonplace. Two generations ago a bachelor's degree was considered the final degree for most individuals entering a field that required higher education. Now master's and doctoral degrees are often required. This trend toward specialization, which is a response to the extraordinary expansion of knowledge and technology during the 19th and 20th centuries, will continue in all areas of human endeavor. New knowledge, new concepts, and new technologies will, in the future, create demand and opportunities for ever more concentrated human activity.

Specialization in medicine has been accepted widely because the public believes that physicians who have acquired knowledge and developed skills in a particular field can diagnose problems more accurately and treat patients more effectively than can those physicians who have not so concentrated. Since 1917, when the first American medical specialty board was established, a total of 23 specialty boards have emerged (Table 5.1). Additionally, branching into fields of concentration within these specialties has led to the development of numerous subspecialties. The continued advance of specialized fields of knowledge and practice can confidently be predicted, as can the increasing benefit of this trend to the quality of the nation's health care.

To the public, however, most of whom will eventually seek medical care, the salutary growth of specialization has been accompanied by two problems.

1. Some have found it difficult or even impossible to locate physicians who will provide, supervise, and integrate their health care. As specialization has grown to keep pace with the expansion of knowledge and technology, coordination of the contributions that multiple specialists can make has become increasingly complex. In response to this a demand has risen for an increased number of primary care physicians whose styles of practice and special abilities include the provision of continuity and integration in the care of their patients. This reflects the desire of patients to have physicians who are their personal health advocates. It is not a denial of the desirability of specialization or of specialists who practice as consultants, as is often suggested.

2. The other problem the public has experienced is the burgeoning cost of health care that has accompanied the discovery of new knowledge and the development of new technology. The number, diversity, frequency, and unit costs of health care encounters have all increased. The enormous increase in the use of diagnostic and therapeutic procedures has been singled out as a major argument for the curtailment of the numbers of physicians who may enter graduate medical education in certain specialties and subspecialties.

Thus, the central issues of what is com-

TABLE 5.1

Establishment of American Specialty Boards

Board	Year Established
Ophthalmology	1917
Otolaryngology	1924
Obstetrics & Gynecology	1930
Dermatology	1932
Pediatrics	1933
Orthopaedic Surgery	1934
Radiology	1934
Psychiatry & Neurology	1934
Urology	1935
Colon & Rectal Surgery	1935
Internal Medicine	1936
Pathology	1936
Surgery	1937
Anesthesiology	1938
Plastic Surgery	1939
Neurological Surgery	1940
Physical Medicine & Rehabilitation	1947
Preventive Medicine	1948
Thoracic Surgery	1950
Family Practice	1969
Allergy & Immunology	1971
Nuclear Medicine	1971
Emergency Medicine	1979

monly called the specialty distribution problem are how to provide an appropriate balance of generalists and consultant physicians and how to ensure appropriate use of technology by physicians in practice. To address these issues effectively, conjoint study and action by the medical schools, teaching hospitals, and accrediting and certifying bodies, together with other private and public agencies, must replace the laissez-faire and even adversary relationships that have sometimes existed among them during the advance of specialization. Specialization in medical practice and the quality of medical services provided to the citizens of the United States are inextricable. In its effort to improve the quality of medical services, the profession must be concerned about the types and numbers of physicians that are being prepared for practice. Even greater attention should be directed toward an examination of the ways in which various kinds of physicians employ their knowledge and skills once they are in practice.

Changing the number and types of opportunities for education and training in graduate medical education alone will have little effect on the quality of medical practice. Satisfactory quality in medical practice is attained when patients who seek care are both diagnosed accurately and treated effectively. To the degree that technological procedures are underutilized, overutilized, or poorly performed, quality also declines. Changes in the mix of specialists and the attributes of physicians being prepared during the graduate phase of medical education must be accompanied by adjustments in economic incentives to make them commensurate with the desired mix of types of practitioners and by professional initiatives to ensure the highest quality of medical practice. These policies must be complementary.

All those involved in the education and training of physicians must concern themselves with questions of licensure, board certification, and practice privileges of physicians in reasonable numbers; with locations of physicians; and with compensation of physicians and health institutions for services. The challenge to both the medical education system and the health care system is to provide the manpower and resources for both continuing, comprehensive care and highly specialized services of high quality, together with measures of their efficacy and costs.

In planning for changes to resolve the issues that accompany specialization and the characteristics of medical practice, seven goals are identified toward which the medical education system, the practicing profession, and public and private agencies should strive. They encompass the balance between generalist and specialist medical services, the analysis of manpower needs, the role of undergraduate and graduate medical education, the incentives that shape medical practice, and the relationship between academic medicine and government. Only through the achievement of these interrelated goals will needed improvements be possible.

Physicians for Comprehensive Care

> *Goal 1*—A plurality of physicians educated and trained in the United States should be prepared to care for patients on a continuing and comprehensive basis. They should depend principally upon their fundamental knowledge and basic clinical skills and make decisions to request specialized techniques and procedures judiciously. They should be skilled in selecting and working with other health professionals, health agencies, and special consultants.

In a high quality medical practice, physicians are challenged to provide empathetic care to patients who usually have relatively simple problems and to remain alert for symptoms and signs that may signal the need for specialized interventions. All physicians, most particularly primary care physicians, must fulfill this responsibility. The term "generalist" best describes these physicians, and it distinguishes them from those who serve as consultants in narrow, specialized fields. Family physicians, internists, and pediatricians usually serve as generalists. For women in their child-bearing years, obstetricians frequently serve as generalists. However, physicians with subspecialty training in medical specialties also serve as generalists, particularly for patients with chronic diseases. Throughout their education and training, students and residents who plan careers that will involve them in continuing, comprehensive care should have five primary aims:

1. Attainment of broad medical knowledge and the ability to collect information about patients through interview, examination, and selection of appropriate laboratory tests and procedures.

2. Attainment of the ability to integrate their observations in order to make accurate diagnoses and select appropriate treatment.

3. Attainment of the ability to provide patients with comprehensive, ongoing care and treatment for a variety of physical and emotional problems.

4. Attainment of the ability to reassure, console, and make patients as comfortable as possible with the uncertainties and limitations that disease may impose.

5. Attainment of the ability to select and participate with other health professionals, health agencies, and special consultants in the continuing care of patients who require specialized services.

Graduate medical education programs for those in the fields of family practice, internal medicine, obstetrics-gynecology, and pediatrics should be organized to afford a balanced opportunity for education in both ambulatory and hospital settings. In both sites, significant opportunities to learn with and from physicians in various specialties and subspecialties should be provided so that the residents may develop the ability to recognize the need for specialized care and to serve patients as advocates and counselors in the selection of consultants. Establishing an educational environment and an institutional milieu that will attract and retain physicians who must fulfill such a broad role is difficult. To be effective, an ambulatory educational setting must provide a wide spectrum of patients, and the residents must be allotted adequate time in which to study their patients' problems and learn to care for them. Such an ambulatory setting requires careful preparation, and it is costly compared with ambulatory clinics that are not engaged in education.

The organization of clinical units in many teaching hospitals is dictated by the need to provide medical and nursing services to patients who require very specialized care. This pattern of organization, which provides for effective specialized patient care and is appropriate for education about complex diagnostic and therapeutic problems, is often incompatible with education about the diverse, interactive problems patients present to the generalist. Reorganization of services or preparation of alternative educational settings may be needed. This can be achieved only after extensive negotiations and the dedication of appropriate resources.

The role of residents in the generalist phase of their education and their relationships with other specialists and with subspecialists in their own discipline during graduate medical education deserve particular attention. Only through deliberate and conscious efforts will the professional, social, and economic gaps that have come to exist in both education and practice be narrowed. These should start during graduate medical education.[7]

> *The emphasis on providing graduate medical education programs in family practice, internal medicine, obstetrics-gynecology, and pediatrics that stress the role of the broadly educated and trained generalist should be continued.*
>
> *Resources should be provided, both through special educational grants and through a change in reimbursement policies, to promote the development and maintenance of adequate ambulatory educational settings as detailed in the chapter on financing graduate medical education.*
>
> *In both ambulatory and hospital educational settings, generalist and specialist residents should learn to work together and gain knowledge of ways in which each can contribute most effectively to the provision of medical care to patients who have diverse problems and needs.*

Providing Specialized Services

> *Goal 2* Specialized services and procedures should be provided only by physicians with the requisite education, training, and competence. Physicians specializing in fields requiring the maintenance of high-level technical skills should be engaged primarily in the practice of their specialties. Generalist physicians subspecializing in an area of their primary specialty should use their breadth of knowledge to provide continuing and comprehensive as well as subspecialized care.
>
> (Conferees were disturbed by possible misinterpretations of this goal. They expressed concerns that it might be interpreted as supporting limited licensing by specialty. The final sentence, which acknowledges the role that generalists with subspecialty education may play in providing continuing, comprehensive care, was added in response to conference discussions.)[7]

The purpose of specialization in medical practice is to provide medical services of a quality commensurate with current knowledge and technology to patients who have medical problems that require specialized intervention and care. Providing specialized services of this quality requires the education and training of specialists and subspecialists in a growing number of areas of concentration. If, however, the numbers prepared to practice specialized medicine exceed the need for specialized services, three unwanted outcomes result. First, specialists, even though thoroughly prepared during their graduate medical education, may not be sufficiently engaged in practicing their specialty to maintain their proficiency. Second, specialists may excessively apply their knowledge and skills to the patients they do see with problems in the realm of their specialty. Third, specialists may extend their scope of practice into areas for which they are not prepared. The quality of medical practice is thereby impaired. Although in some areas generalists may be called upon to deliver specialty services when qualified specialists may not be available, the quality of medical practice can be impaired if physicians with insufficient education and training routinely try to provide specialized services.

Achieving a consensus on the number of specialists and subspecialists to be prepared will be difficult, perhaps impossible. The present emphasis on increasing the number of generalists may be overshadowing future shortfalls in other disciplines. Medicine is not static. New knowledge and new technology will require the preparation of new types of specialists as the ability of physicians to diagnose and treat disease is advanced through research. For this reason, estimating the numbers and kinds of specialists that should be educated and trained for the future is difficult. In the United States, the application of specialized knowledge and techniques is not restricted to physicians who are prepared as specialists. This makes impossible a determination of whether or not specialists who are prepared to enter practice will have opportunities to utilize their knowledge and skills to the fullest extent. In the discussion of Goal 6, the great economic incentives to apply procedures excessively in the practice of medicine are stressed. Procedures, when applied by physicians who are not fully prepared to assess their appropriateness or effectiveness, are likely not to be of benefit and can be harmful as well as costly.

In estimating the need for specialists, roles that various specialties play in the practice of medicine must be differentiated. For example, physicians prepared as diagnostic radiologists expect to and are expected to provide skillful application of the complex technology of radiographic imaging to meet the diagnostic and management needs of their patients. They are not expected to provide continuing, comprehensive care to patients. Similarly, surgeons are expected primarily to assess the need for surgical intervention, to be skillful operators, and to deliver preoperative and postoperative care to patients with surgically amenable disease. To the degree that radiologists and surgeons are not fully practicing their specialties, the quality of medical care suffers because their proficiency declines.

Conversely, physicians who are prepared as internists and who have been thoroughly grounded in general internal medicine may be more capable of providing continuous, comprehensive care to specific categories of patients if they have had subspecialty training (23). As the distribution of the U.S. population continues to shift toward a higher proportion of the elderly, the number of patients whose medical problems derive from degenerative or chronic disease of various organ systems will increase. The medical care problems posed by this aged population will increase the demand for physicians who have both the knowledge and skill to diagnose and manage problems of specific organ systems and who can and will simultaneously provide continuing, comprehensive care. To illustrate, the likelihood is that many diabetic patients will receive better care when their general medical services are provided by physicians who know how to apply the full array of available knowledge and technology to the prevention or treatment of the many complications to which diabetics are susceptible. Consequently, in some instances, internists who have subspecialty training in endocrinology may well be the primary care physicians for diabetics and should undertake the management of their medical services.

However, in undertaking this role, medical subspecialists must provide comprehensive, continuing care and not focus only on the problems related to their areas of subspecialization.

This concept of the generalist also having subspecialist skills poses several questions.

1. Should each generalist (internist, family physician, obstetrician-gynecologist, and pediatrician) also have an area of special interest? Some generalists are attracted to the problems posed by one organ system over another, and a degree of concentration of interest provides intellectual stimulation. Licensure policies permit generalists to employ specialized techniques and do not require that they have more than rudimentary knowledge and skills.

2. If generalists do develop areas of concentration, at what point will the quality of their services suffer because they will be less interested in providing continuing, comprehensive care? Will their skills in providing specialized services be inadequate because of both insufficient preparation and underutilization?

3. How will specialty or subspecialty concentration by generalists affect the utilization of fully prepared specialists and subspecialists? Will the proficiency of fully prepared specialists and subspecialists decline because they are not fully engaged in practicing their specialty or subspecialty?

These questions illustrate the dilemma which medical educators, the practicing profession, and public and private agencies must resolve as they assess (*a*) the need for specialists and subspecialists and (*b*) the relationship among generalists, specialists, and subspecialists. Predictions of future manpower needs must be based upon a realistic appraisal of the anticipated role that each will play in the health care system of the future. The appropriateness of these roles must be judged by assessing the adequacy of medical services being provided. Such assessments should focus on rational geographic and demographic units.

There have been many studies directed at estimating the need for physicians of various types in the United States. Approaches vary. Some have sought consensus among practitioners of a particular specialty regarding the need to increase or decrease their numbers. Other studies have been based upon assessments of the current level of demand for services provided by a specialty. Still others have tried to predict future needs by attempting to estimate the prevalence of diseases and medical problems in the population and relating such estimates to the mix of specialists needed on the basis of the time and effort required to diagnose and treat various conditions.* All of these efforts fail to provide sufficiently reliable or valid data to justify policies that would change rapidly the specialty mix of graduate medical education positions. They also fail to meet the test of local significance. Formulas to predict national needs do not provide for the specific needs of various geographic areas and populations.

National specialty societies, third-party payers, academic medical centers, and governmental agencies should collaborate in the development of approaches

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* The Graduate Medical Education National Advisory Committee (GMENAC), which was first chartered by the Secretary of Health, Education, and Welfare in 1976, issued its report on physician supply and requirements on the same day as the AAMC's Conference on Graduate Medical Education. The GMENAC predictions for requirements were based on the prevalence of disease and assumptions about the number of physicians in the several specialties needed to provide services to patients with various diseases. The inability of GMENAC, or any group, to forecast changes in diagnosis and treatment due to new knowledge and technology, coupled with the numerous assumptions that were made, has evoked significant criticism of the predicted requirements both for the total number of physicians and their distribution by specialty.

> *to assess the adequacy of medical services. Assessments should be related to the adequacy of medical services in defined, rational geographic areas and the adequacy of medical services to specific populations having common demographic characteristics within such geographic areas.*

Modifying Physician Supply

> *Goal 3*—Policies to adjust the availability of opportunities for education and training in the various specialties and subspecialties of medicine should take into account the length of the period required to prepare physicians to be proficient practitioners and the unpredictability of the influence of advances in the biomedical sciences on the characteristics of medical services to be provided the population in the future. Approaches to the modification of the mix and size of graduate medical education programs should be based upon preserving the diverse missions of medical schools and teaching hospitals and assisting them in their efforts to meet their local, regional, and national obligations to prepare qualified physicians to supply the medical services required by the U.S. population.

The graduate education of physicians to be proficient practitioners of their specialties requires three to seven years. This lengthy period imposes a need to make adjustments in educational programs slowly and judiciously. The effects of change on both the quality and quantity of future medical services that will be provided cannot be assessed until the physicians entering the specialties affected by a change are in practice. Predicting the effect of an adjustment in available opportunities for education and training in a specialty is further complicated by three major factors.

1. Advances in the biomedical sciences and their attendant impact on the need for practitioners with new knowledge and skills are occurring at an increasing rate. The need for practitioners of a particular specialty may be either increased or decreased.

2. National, state, and local perceptions and policies regarding the quantity and level of medical services to be made available to various populations fluctuate and are unpredictable.

3. The United States has gone through an unprecedented expansion of the number of its medical schools and the size of their classes. The effect of doubling the number of physicians being prepared for practice cannot yet be estimated.

The long period of preparation and the unknown consequences of these three factors on the requirements for medical services a decade hence argue against a national strategy for modifying the specialty distribution of physicians based principally on controlling access to opportunities for education and training. There is evidence that the recognition and articulation by both the profession and society that trends in specialty distribution need to be altered have already had an effect. During the past decade, the national concern to increase the number of generalist physicians has resulted in a significant expansion in the number of students selecting careers in family practice, internal medicine, obstetrics-gynecology, and pediatrics, while the number selecting careers in other specialties has grown less rapidly. The effect of this trend will not be observable until a substantial number of these generalists establish the location and style of their practices.

Of particular note is a recent study by Schwartz and colleagues in which trends in the distribution of board-certified physicians in eight specialties between 1960 and 1977 were analyzed (24). They found an unanticipated migration of specialists from metropolitan areas into smaller communities. They attributed this to the increased number of physicians and specialists and hypothesized that economic forces were causing specialists to locate in communities previously considered insufficient in size to support their services. In 1977, 75 percent of the towns with populations between 10,000 and 20,000 were served by specialists in family practice or by a combination of specialists in internal medicine, pediatrics, obstetrics-gynecology, and surgery.

> *The consideration of policies to modify the opportunities for education and training in various specialties should be undertaken with full recognition of the imprecision in forecasting the need for specialists and the mounting evidence that medical students do modify their career choices when there is a general agreement that a change in specialty distribution is needed. The precise control of graduate medical education positions through an allotment system can neither be justified nor proved necessary. Such control, which has been proposed at both national and state levels, should be avoided.*
>
> (Conference discussants expressed strong agreement about the importance of this statement. They were concerned about the potential impact of the report of the Graduate Medical Education National Advisory Committee which predicted a surplus in a number of specialties. The possibility that efforts to effect abrupt reductions in graduate medical education positions by some form of federal or state regulation was raised. There was a consensus that such efforts would be disruptive. Further, in light of already recognized changes in physician distribution, the conferees believed that regulatory control will not be needed.)

The avoidance of an allotment system to control opportunities for specialty education and training does not imply that there should not be concern about approaching an appropriate distribution of graduate medical education positions to be offered in the specialties and subspecialties. However, this concern should be multicentric and lodged with the diverse institutions that provide graduate medical education in the United States. Chapter 2 explains how teaching hospitals and their graduate programs have coalesced into academic medical centers associated with a medical school and points out that the faculty for graduate medical education and undergraduate medical education is essentially the same. Each academic center is now responsible for the education and training of two classes of students as demonstrated in Table 5.2. One is the class admitted to medical school from college, and the other is the class admitted from medical school to the center's graduate programs (9).

The centers have diverse missions, are unevenly distributed across the country, have varying obligations to their states and regions, have complex interinstitutional relationships, and are supported financially from multiple sources. In the past, institutional concerns about class size and educational policy have been limited to the undergraduate phase of medical education for which an accredited medical school is responsible. There is a growing trend for academic centers to believe that their graduate medical education programs should also be of broad institutional concern involving greater responsibility for the mix and size of their graduate programs and their quality. This trend provides a new opportunity to effect change in the number of specialty education opportunities available by building upon the local knowledge and diverse mission of these centers.

In order to develop institutional approaches to modifying the mix and size of their programs, the academic medical centers require assistance in two areas.

1. Academic centers need information about the number, types, and practice locations of those who complete their graduate programs. When fully operational, a tracking system, now in development, will provide data to enable the institutions to examine whether the output from their

TABLE 5.2

Residency Profile of a Medical Center

Group Type	Graduates from School in Hospitals					Total Positions Offered	First-Year Positions Filled by U.S. Graduates in Hospitals Associated with This School			
	Associated with This School	In Same State	In Other States	Federal	Total		From This School	From This State	From Other States	Total
Family practice	5	7	8	0	20	28	5	5	18	28
Internal medicine	7	0	36	2	45	36	7	4	25	36
Pediatrics	1	1	12	0	14	15	1	1	12	14
Obstetrics/gynecology	3	0	3	2	8	9	3	0	6	9
Neurology	0	1	1	0	2	0	0	0	0	0
Psychiatry	5	0	2	0	7	13	5	1	7	13
Surgery	1	1	7	4	13	19	1	1	15	17
Orthopedic surgery	0	1	0	0	1	2	0	1	1	2
Anesthesiology	1	0	0	0	1	6	1	0	4	5
Pathology	1	0	0	0	1	4	1	0	3	4
Radiology	0	4	2	0	6	2	0	0	2	2
Flexible	1	0	3	2	6	8	1	2	5	8
Preventive medicine/public health	1	0	0	0	1	1	1	0	0	1
Total*	26	15	74	10	125	143	26	15	98	139

SOURCE: National Resident Matching Program.

*The percent of total graduates for each respective column is: 20.8, 12.0, 59.2, 8.0, 100, 114.4, 20.8, 12.0, 78.4, 111.2

graduate programs is consonant with their stated mission and their obligations to meet medical service needs.

2. Resources are needed to promote both the expansion and contraction of graduate programs in an academic center. Reducing the number of residents in one program and increasing the number in another is difficult, even when intrainstitutional consensus has been achieved. For the program that is to be reduced, the patient care responsibilities and the educational responsibilities to other services will usually not change. Replacement personnel must be assigned to fill these responsibilities, and the cost of these replacements may increase the cost of the program. For the program that is to be expanded, additional clinical resources and new personnel will have to be developed to maintain the quality of patient care and education. In most cases, the simple transfer of resources from one program to another is not feasible. To illustrate, reducing the number of residents in a surgical program will reduce neither the number of surgical patients for whom the service must assume responsibility nor the number of surgical consultations requested by other services. If the remaining residents attempt to provide the same level of services, their education will be impaired. Full-time surgeons who have completed their training will be needed to replace residents. The cost of the surgical program will be greater. Reducing the number of residents in the surgical program will not produce funds to expand another program.

The provision of resources to promote new program development or the expansion of existing programs is presently provided largely through project grants. The concept of requiring additional resources to compensate for the cost of reducing or eliminating a program has not yet been widely discussed or understood. These issues are developed in greater detail in the chapter on financing graduate medical education.

The evolving system for tracking the career development of medical students and residents should proceed and be expanded or modified in order to provide academic medical centers with ongoing, accurate information about the types and numbers of specialists and subspecialists being educated in their sponsored graduate medical education programs.

Both granting and reimbursement policies should be adapted to promote opportunities for academic centers to adjust the mix and size of their graduate programs in accordance with their missions and obligations while maintaining the quality of both education and patient care.

Providing Subspecialty Education

Goal 4—Physicians seeking certification of special competence in a subspecialty by a primary specialty certifying board should be required to be educated only in programs approved by residency review committees and accredited by the Liaison Committee on Graduate Medical Education.†

(Conference discussants generally viewed the accreditation of subspecialty training programs as highly desirable. Concern was expressed that accreditation of subspecialty training programs might subsequently lead to those subspecialties wanting status as primary boards.)

Specialty board policies require that physicians seeking primary certification in a specialty obtain their education only in programs approved by residency review committees and accredited by the Liaison Committee on Graduate Medical Education. This requirement has generally ensured that graduate programs have sufficient resources and educational commitment to prepare their residents for certification. Third-party payers have restricted their funding to programs that are accredited.

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† The Liaison Committee on Graduate Medical Education was replaced by the Accreditation Council for Graduate Medical Education effective January 1, 1981. See Appendix 1 for additional information.

Subspecialty disciplines have evolved as areas of particular concentration within a primary specialty. Primary boards now award special certificates in 29 subspecialties. The American Board of Internal Medicine, for example, awards a certificate of special competence in 10 subspecialty areas, and the American Board of Pediatrics recognizes six subspecialties. To be recognized as subspecialists by these boards, candidates must be certified by the primary board, have two or more years of education in a subspecialty program associated with a primary program, and pass an examination. Out of 14 subspecialty areas in medicine and pediatrics, only pediatric-cardiology programs have residency review committee accreditation standards and are accredited by the Liaison Committee on Graduate Medical Education.

For several years the pediatrics and internal medicine boards have requested that the Liaison Committee on Graduate Medical Education develop an accreditation process to ensure that their subspecialty graduate programs meet acceptable standards of quality. The Liaison Committee on Graduate Medical Education is now beginning to implement procedures to accommodate these requests. Meanwhile, third-party payers have had no means of evaluating whether these subspecialty programs are of sufficient educational quality to merit the provision of financial support. Medical schools and teaching hospital officials also have had no national measure of the quality of the subspecialty programs in their institutions.

It can be anticipated that more subspecialties in various disciplines will evolve and specialty boards will certify physicians in new areas of special competence. As this occurs, the Liaison Committee on Graduate Medical Education should include these programs in the accreditation process much more rapidly than subspecialty programs have been included in the recent past. Implementation of the recommendations in Chapter 4 will facilitate this.

The Federated Council for Internal Medicine has recommended that the number of positions in subspecialty education and training be modified (25). In 1978 the Association of American Medical Colleges recommended that subspecialty positions in medicine and pediatrics be reduced by one-third. The Task Force on Graduate Medical Education believes that the imposition of a specific national target for subspecialty training opportunities is neither necessary nor desirable. While the standards set for accrediting subspecialty training may restrict the number of sites for graduate training to settings considered of acceptable educational quality, the system of accrediting graduate and fellowship education should not be used to manipulate the number of physicians prepared for the practice of particular specialties and subspecialties. Requiring subspecialty programs to be accredited will ensure that only programs with sufficient resources and acceptable educational quality are available for subspecialty education and training. As accreditation of subspecialty programs becomes available, agencies responsible for their financing should support only accredited programs. Institutions should assess the societal need for subspecialists in a discipline before seeking program accreditation.

The residency review committees and the Liaison Committee on Graduate Medical Education should improve and expand their accreditation procedures and include graduate programs for all *subspecialties for which a certificate of special competence is awarded by a specialty board.*

When accreditation of subspecialty programs by the Liaison Committee on Graduate Medical Education is available, agencies responsible for the support of graduate medical education should restrict their funding to accredited programs.

When accreditation of subspecialty programs is made possible by the Liaison Committee on Graduate Medical Education, academic medical centers should assess whether or not the need for subspecialty services justifies their development of accredited programs.

Broad Education of Medical Students

Goal 5 The undergraduate medical education of students should ensure (*a*) that they are thoroughly prepared to enter the graduate phase of medical education and (*b*) that they have attained broad fundamental knowledge and basic clinical skills. Concentration in a specialty track that precludes a broad curriculum during the undergraduate period should be discouraged.

Most students, when selected for admission to medical school, have insufficient knowledge upon which to base an informed decision about what their ultimate specialty career will be. At present, assessment instruments are not available that reliably will permit the selection of students on the basis of their likelihood of pursuing one specialty over another. Medical schools should continue to select students who are both intellectually capable and who have the personal qualities needed to fulfill the broad responsibilities expected of all physicians. During their undergraduate education, the faculties should ensure that students attain fundamental knowledge in both basic and clinical sciences and should particularly focus on their development of basic clinical skills.

Academic medical centers have become increasingly complex organizations that carry out a variety of educational, research, and patient care missions. In most cases, the faculties are expected to provide sophisticated specialty services and to engage in both basic and clinical research. These missions result in a pattern of organization of teaching hospitals and clinics that, while being excellent settings for the education of advanced specialists, may not be appropriate for teaching basic clinical skills to undergraduates. A faculty composed principally of specialists and subspecialists whose major role is to apply advanced knowledge and technology to clinical problems in narrow domains of interest may neglect to demonstrate to students that most medical problems are amenable to simple methods and may fail to ensure that students acquire basic knowledge and skills. This dichotomy must be recognized, and medical school faculties should analyze whether or not their research and advanced educational responsibilities interfere with the sound preparation of medical students for graduate medical education. Alternative clinical educational settings and faculty members who are recognized and rewarded for their ability to concentrate on teaching basic clinical skills may need to be developed. Techniques to evaluate whether or not students have attained basic clinical skills before graduation should be developed and implemented by every faculty.

Medical school faculties should examine their curricula and the goals and objectives of their instructional programs for undergraduate students and ensure that all students have broad, fundamental knowledge and basic clinical skills.

> *Flexible institutional support should be provided to assist in such curricular reorientation.*

Modifying Reimbursement Policies

> *Goal 6.* Changes in the mix and type of specialists being prepared through graduate medical education should be paralleled by complementary changes in reimbursement policies for medical services so that the economic incentives shaping medical practice are consistent with the desired changes in specialty distribution.
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> (In the conference discussion groups, Goal 6 was highly controversial. Some discussants opposed Goal 6 in its entirety, or found the goal desirable but difficult to implement, or criticized the task force for an unwarranted attack on physicians who practice in procedure-intensive specialties who apply the procedures judiciously.
>
> (Some thought that choosing a specialty is a "multifactorial" decision and that economic grounds alone are not a major influence. Some expressed the view that economic factors play a greater role in decisions about practice patterns within a specialty than in career choices among specialties by students and argued that potential income is not a factor in specialty selection at the undergraduate medical level.)

Efforts to change the specialty distribution of physicians have in the past been directed almost solely toward changing the mix and types of opportunities available for graduate medical education. Little attention has been paid to whether the influences beyond graduate medical education which shape medical practice are consistent with the pattern of specialty distribution that is desired.

The concept of having a plurality of physicians who will develop personally satisfying careers as generalists to provide continuing, comprehensive care and act as patient advocates when specialized services are required is antithetical to present policies that pay a premium for diagnostic and therapeutic procedures and undervalue basic clinical knowledge and skills. Payment for the professional time invested in listening to, examining, and counseling patients is so inadequate that generalists must keep their interval of time with each patient to a minimum and utilize it to order or perform procedures. Even when generalists do not directly perform a procedure, they refer patients to specialists for a procedure in order to reduce the time that otherwise they would need to spend with patients.

Physicians prepared to be generalists often become frustrated by their inability to provide the quality of services they desire because they must both see a great number of patients and order or perform procedures for which they are not well prepared. No matter how motivated they are to be generalists, many eventually will either limit their practices to a specialized area and seek to improve their skills in that area through short, continuing medical education courses, or they will return to graduate medical education for extensive training in a specialty or subspecialty.

> (Some conferees objected to this statement on the grounds that it cast doubt on whether physicians prepared as generalists could or would maintain long-term careers as providers of continuing, comprehensive care.)

Restructuring payment policies for medical and hospital services to decrease the premium paid for procedures will be resisted. Developing equitable payment policies which will encourage only the selective use of technical procedures and reward sound clinical judgment will be difficult; but unless the economic incentives are changed, efforts to modify the distribution of specialists will have little effect on improving the quality of medical care.

> *Academic organizations, national specialty societies, hospital associations, and third-party payers should work to-*

gether to develop payment policies that will reduce the economic incentives to overutilize procedures.

Effecting Desirable Change

Goal 7 Academic medical centers, specialty boards, professional societies, and federal and state governments should work together to improve the distribution of physicians and the adequacy of medical services. The inability to effect a detectable change in a short time should be recognized, and program modifications should be based upon a realistic schedule that takes into account the three- to seven-year period of graduate education needed to prepare a physician.

(Conference discussants noted that Goal 7 implies an ongoing data collection system without specifically stating whose responsibility this would be, what should be collected, and how this can be accomplished. Data that should be obtained include defining what services physicians actually provide [which may be different from what they are educated to provide] and what their migratory patterns are. The best data possible should be obtained but with the full realization that they are not always reliable, that some specialties will always have trouble recruiting, and that needs cannot be projected 15 years off. Current trends should be examined rather than attempting long-range predictions. If data were developed and provided to medical students, residents, program directors, and others, people could make enlightened choices that would deal with these issues.

(Some said that the specialty distribution system should be controlled at the level of entering medical students rather than at the residency level. Several discussants asked whether anything should be done to alter the choices of undergraduates for specialty training in view of emerging market forces. Medical students are now investigating whether specialties are in long or in short supply in areas in which they would like to locate. The argument was made that this would ultimately promote proper specialty choices. Optimism was expressed that the marketplace will work without regulation.)

Historically, the partnership between the medical schools and government has been most productive when there was agreement on the goals and the resources as well as the time needed in which to achieve them. After World War II, expansion of the nation's biomedical research effort was made possible by the collaborative efforts of the medical schools and the National Institutes of Health to increase the number of biomedical scientists and to support their research programs. The government did not demand immediate results, and over a period of two decades spectacular gains were made in basic knowledge and in the ability of physicians to intervene effectively in the prevention and treatment of disease.

When accord was reached to increase the number of physicians being educated, federal and state governments supported the academic institutions in the expansion of classes and in the founding of new schools. Within a decade, the number of students entering U.S. medical schools doubled.

However, in the debates over how many specialists and what kind should be prepared, it has been difficult to clarify the limited role of the academic medical centers and to gain sufficient time for program development or modification. As a result, the relationship between the government and the academic medical centers has moved from one of harmony with mutual understanding and support to one of coercion. Laws, regulations, and agency policies have been based on the thesis that the academic medical centers are unwilling to become involved in modifying the distribution of specialists. Rather than providing incentives to change and then allowing the centers to initiate programs best suited to their missions and resources over a reasonable time period, the government has attempted to coerce all institutions by threatening to withhold support and has expected responses to occur in an unrealistically short time. Even when positive incentives have been provided through special project grants, the terms and conditions imposed for support and the period of support have been unrealistic and have failed to capitalize on the diversity of the institutions and their creative ability to innovate if given adequate resources and time.

Governmental impatience and the growing tendency to be coercive have made adversaries of government and academic medicine. Both sides must recognize that neither can change specialty distribution or improve the quality of medical services provided in the United States unless both agree regarding what needs to be accomplished, what can be accomplished, and what resources are needed to achieve the goals. The influence of factors beyond the control of academic medical centers that will perpetuate the maldistribution of specialists must be taken into account if accord is to be reached establishing a mutually productive partnership to solve this complex problem.

Conference Discussion

Dr. Spencer Foreman reported for the six conference workshops of 108 individuals who discussed specialty distribution and graduate medical education. Observations from these groups are presented throughout this chapter.

Goal 6, related to reimbursement policies and specialty distribution, was defended by one spokesman who has experienced difficulty in recruiting faculty from high-income specialties such as gastroenterology, cardiology, and nephrology. He suggested that the statement was not strong enough and pointed out that specialty choice is not made at the medical student level but at the residency, fellowship, and faculty level.

It was suggested that the report might include a recommendation that each educational institution be responsible to provide an equitable number of residency positions relative to the number of graduates it is producing. The chairman described ongoing efforts by responsible organizations in the field of internal medicine to get the number of residency positions in the first three years of internal medicine to meet the need more appropriately.

Working Group on Specialty Distribution and Graduate Medical Education

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Observer/Participants

Robert Graham, M.D.,* executive secretary, Graduate Medical Education National Advisory Committee, and deputy director, Bureau of Health Manpower (resigned June 1979).

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Chapter 6

The Financing of Graduate Medical Education

Medical education, both in the undergraduate and graduate phases, is based upon the direct involvement of students in the diagnosis and treatment of patients. The case method is the foundation of clinical education and training. This requires that the education of future physicians be conducted in those settings in which medical services are currently being provided to sick patients. Medical and surgical services can be provided in the absence of education and training of medical students and residents, but education and training cannot be accomplished in the absence of patient care services. This dependence of medical education upon direct, active, and intimate involvement in patient care creates complicated financial policy problems that must be recognized and resolved.

Currently, over 60,000 graduate physicians are enrolled as residents in graduate medical education programs in the United States. In previous generations, medical school graduates generally entered practice after a single internship year. In 1979, 93.2 percent of the U.S. graduating class responding to a survey by the Association of American Medical Colleges expressed the intent to complete the educational requirements for specialty certification (8). These requirements will range from three to seven years.

Prior to the 1960s, residents in most programs did not receive significant stipends. Their clinical experience was gained primarily in public hospitals and the charity wards of nonprofit, voluntary hospitals. Supervised by their mentors, residents participated in the care of patients to whom medical services were provided through state and local tax funds or philanthropy. Program faculties consisted of combinations of salaried physicians, whose incomes were derived from medical schools or teaching hospitals, and volunteer physicians who participated in the education and training of residents without remuneration. Although there were costs in the provision of services to the medically indigent in that era, the minimal stipends for residents and the voluntary efforts of teaching physicians kept hospital expenditures for graduate medical education low, and the source of financing was not an issue. In contrast, 20 years later the cost of graduate medical education and how it should be financed are major issues. The origin of these issues must be explored, and the rationale of current financing mechanisms must be evaluated if future policies for stable financing are to be formulated and implemented.

The Evolution of Financing

Beginning in the 1950s and culminating in the early 1960s, philosophy and policies changed regarding the financial support of residents during their graduate medical education. Change occurred for several reasons. Medical educators and the profession-at-large recognized that a single internship year was no longer sufficient to prepare graduates to be proficient practitioners. Increasing the length of graduate education and making it available to all graduates regardless of their economic status also made it necessary to provide stipends sufficient to permit residents to pursue graduate medical education rather than to enter practice before they were prepared. This change from the old philosophy that interns and residents should be provided only personal subsistence and a minimal, if any, cash allowance added substantially to the cost of graduate medical education. Direct costs for stipends and fringe benefits for fiscal year 1979–80 have been estimated to be $14,800 per year per first-year resident (26). Based on Council of Teaching Hospitals' survey data for 1979, it was estimated that approximately $1.2 billion was spent on resident stipends and benefits for fiscal year 1979–80. The national expenditures for health care services for 1979 were projected by the Secretary of Health, Education, and Welfare to be $206 billion. Stipends represent one-half of one percent of these expenditures.

Since World War II, expenditures for medical care, rather than being borne directly, have increasingly been reimbursed through medical insurance programs. In fiscal year 1977, 94 percent of all hospital revenues were derived from insurance programs (27). Medical insurance is now an assumed fringe benefit that employees receive. Those beyond their working years are covered by Medicare, and Medicaid offers some financial support to provide for the needs of the poor and near-poor.

The evolution of medical insurance in the United States paralleled the change in philosophy regarding the quality and amenities of medical services that should be provided to the entire population. This is usually expressed as moving away from a two-class system—with the indigent receiving medical care in crowded outpatient departments and charity wards and the affluent receiving care in separate and more comfortable facilities—to a one-class system with the fiscal barriers to medical services at the same level for all removed. This change in philosophy is generally accepted, but its realization is not yet complete.

Guided by the one-class philosophy and faced with the necessity of increasing the number of positions in existing programs and creating positions in new and developing programs, medical educators extended their programs to include clinical care settings that previously had not been significantly involved in graduate medical education. These were private pavilions and clinics where the attending physicians charged for their services and expected payment from their patients and/or reimbursement from third-party insurers. These developments began to inject financing issues into graduate medical education.

In the 1970s two more factors complicated the financing issue. The rapid escalation of medical care costs, particularly total hospital care expenditures, which averaged 13.9 percent per year from 1965 to 1976, has caused third-party payers—the industries that pay medical insurance premiums and the federal and state programs that insure the unemployed—to attempt to control costs. For a variety of reasons, teaching hospitals have been prime targets for cost control. The second factor is the growing dependence of medical schools and their faculties on professional fee income, both to support educational programs and to maintain reasonable parity in income for the faculty.

The issues generated by changes in where graduate medical education is provided, by changes in philosophy and policies about resident stipends, by the movement toward a one-class versus two-class system, and by the change to predominant payment for medical services by third-party payers are complex. Their resolution must involve negotiation and understanding among medical educators, hospital administrators, private insurers, industrial purchasers, and state and federal insurance programs. It is particularly important that long-term policies for the stable financing of graduate medical education be developed and implemented.

Reasons for Financing

If acceptable policies are to be developed and implemented to finance graduate medical education, there must be concurrence with its goals. In the chapter on The Quality of Graduate Medical Education it is stated that the principal goal is to prepare proficient practitioners and equip them for continued professional development. The secondary goal is, in the aggregate, to prepare a spectrum of physician specialists consistent with the medical services that are to be made available to our citizens. If these goals are accepted, then financing policies should facilitate their accomplishment.

To accomplish the principal goal, adequate financial resources are needed to provide graduate medical education of three or more years' duration for every graduate from an accredited U.S. medical school in an accredited graduate medical education program. To accomplish the secondary goal, these resources should be derived from sources that are sufficiently flexible to allow change in the size and scope of programs in the several specialties of medicine and to permit the development of new programs and the reduction of old ones as medicine advances and as public expectations change.

Graduate medical education should not be financed for the sole purpose of providing direct medical services to patients for whom physician services are not available. The need to finance residency programs without regard to their merits in order to provide patient care to an underserved population has often been expressed. The provision of services to these populations should be accomplished by alternate means if the educational programs are not of sufficient quality to achieve the primary goal of graduate medical education.

Education Versus Service

A controversy surrounds the status of residents. Are they graduate students pursuing education for the purpose of qualifying as independent practitioners, or are they qualified physicians serving as employees of hospitals in an on-the-job training program? Is financial support provided to them in order that they may complete the graduate phase of their education, or are they paid for the professional services they provide in the course of their activities as resident physicians responsible for the care of patients in a hospital or clinic?

These issues are complex. Some residents are concerned that if they are given the status of graduate students, they will be deprived of opportunities to organize and bargain collectively for the terms and conditions of their employment. Some teaching hospital and academic administrators are concerned that if residents are given the status of graduate students, institutions will not be reimbursed for the professional services residents provide during their education and training.

Historically, those physicians who chose to pursue graduate medical education beyond the internship year made a personal decision to forego the potential earnings available to them if they entered practice. In order to gain greater knowledge and skill, they sought a relationship with mentors who, in the context of their medical practice, could teach them. They assumed some of the responsibilities for the care of their mentors' patients, which was necessary to achieve their educational goals. This assistance was of benefit both to their mentors and to their mentors' patients. The difference between resident physicians having this relationship to a staff of teaching physicians and physicians hired by hospitals to care for patients without a commitment to their education was distinguished in the report (7) of the Advisory Board for Medical Specialties' Commission on Graduate Medical Education in 1940:

> The appointment of a young physician primarily to aid the medical staff in the care of patients should be clearly distinguished from appointment of a resident who is to be given educational opportunities. The former can be described best as a "salaried house officer."

The commission was clearly concerned that hospitals or services employing contract physicians not be considered to be preparing physicians for recognition as specialists.

Subsequent to World War II, the growing demand for graduate medical education caused a rapid increase in the number of hospitals offering graduate medical education and the number of positions available. During the late 1940s and 1950s, disparities were seen in the stipends teaching hospitals offered. Those hospitals with reputations for high quality graduate medical education offered little more than subsistence and a small allowance, while those of lesser reputation provided significant stipends to attract residents. These stipends presumably offset the lesser educational opportunities offered to residents in these hospitals.

In the 1960s, when the growing need for essentially all medical school graduates to have extensive graduate medical education was apparent and all teaching hospitals began to provide significant stipends, the financial burden of this support was assumed by public and private agencies responsible for the payment of hospital expenses on the basis of the professional services provided to patients by residents in the course of their education and training. Contractual agreements between residents and hospitals specifying the terms of their remuneration became common.

Some have compared this status with that of individuals entering other professions. They cite, for example, the field of law. Law firms may hire recent graduates and assign them roles in which they provide service to the firm's clients while they are learning from the firm's senior partners. The law firm, in turn, bills its clients for services that include those of the new graduates. The same applies to industrial firms where recently graduated engineers and administrators are provided on-the-job training, the costs of which are ultimately recovered in the pricing of their products. However, firms that provide education to their junior professionals are generally motivated by their desire to recruit and keep them as long-term employees. They provide educational opportunities, mainly consistent with the firms' needs, to employees who are expected to stay with the firm. They are not subjected to any external scrutiny of the content or quality of their educational offerings. Their motivation and the control of the scope of their educational programs are, thus, quite different from those of teaching hospitals.

First, teaching hospitals do not expect residents who complete their graduate programs to join their staffs or even remain within their communities.

Second, unlike any other profession, there is a consensus among medical educators, practicing professionals, hospitals, public and private agencies, and residents themselves that graduation from medical school is not a sufficient credential for the independent practice of medicine.

Third, medicine has developed a highly structured system through specialty board certification to provide credentials recognized as sufficient for the independent practice of medicine.

Fourth, there is a national system to set educational standards and to accredit programs in graduate medical education that are acceptable to specialty boards for the education and training necessary to be considered for certification by the boards.

Thus, graduate medical education has evolved into a formal phase in the preparation of physicians that is more like university-based graduate education in other professions and disciplines than on-the-job training. However, it is predominantly conducted in the workplace of medicine, rather than in university classrooms and laboratories; thus, the controversy about resident status remains unresolved.

The foregoing arguments demonstrate the unique status of residents. They are completing the final phase of their education and training as physicians in a formal and structured system which exists in the workplace of medicine. They are not quite like graduate students, and they are not quite like employees receiving on-the-job training. They are residents. They require financial support because most could not finish their preparation to be proficient practitioners of medicine without support, and they deserve financial support because their participation in the care of patients in the course of their education contributes to the quality of care in teaching hospitals.

Effective graduate medical education requires that residents assume graded responsibility for interviewing and examining patients, selecting diagnostic tests and procedures, and integrating all available information to formulate diagnoses and develop therapeutic plans. Depending upon the specialty, residents also must learn to perform various technical procedures. In well organized and supervised programs, junior residents have the initial contacts with patients and, after making their observations and reaching preliminary conclusions, they consult with more experienced senior residents and with the responsible supervisory faculty. The timing and frequency of such supervisory consultations vary with the urgency of the case and the type of specialty. In surgical programs, where the need for operative intervention is an important decision, residents' therapeutic recommendations and plans are closely supervised and there are frequent contacts between residents and faculty. In medical programs, the timing of the review of cases by faculty with residents may be quite different, with scheduled reports and rounds being the predominant mode. For both surgical and medical specialties, the degree of immediate supervision of residents while performing diagnostic or therapeutic procedures is determined by residents' prior experience, their demonstrated acquisition of skills and the complexity and urgency of the procedure.

In well organized and supervised programs, residents are permitted to assume responsibility for patients' care commensurate with their ability and experience. Each patient is unique. Regardless of the complaint, diagnosis, or required treatment, residents can usually increase their knowledge and skills from each patient contact. Programs that do not provide an organization and supervisory system to maximize the opportunity for residents to learn from each patient they care for should be subjected to vigorous scrutiny by the responsible residency review committees and the Liaison Committee on Graduate Medical Education.* If their resources or their educational commitment are insufficient, these programs should not be accredited.

Laxity in accreditation has permitted some hospitals to exploit residents. Excessive service requirements and poor supervision by medical staffs with an inadequate commitment to education have caused justifiable complaints by residents who entered programs in these hospitals expecting that their accredited status provided assurance of their educational quality. The Liaison Committee on Graduate Medical Education has made significant progress in improving the accreditation system. Implementation of the recommendations in the chapter on National Standards Formulation and Accreditation will further strengthen accreditation as a means to prevent exploitation and abuse and ensure educational quality. In the future, institutions and programs must not be permitted to exploit young physicians under the guise of providing graduate medical education.

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* By ratification of its bylaws by all five parent organizations, the Accreditation Council for Graduate Medical Education officially replaced the Liaison Committee on Graduate Medical Education on January 1, 1981. (See Appendix 1.)

Costs of GME

Numerous studies have been done on the costs and financing of graduate medical education (28–37). The most extensive is the study by the Institute of Medicine on Medicare-Medicaid reimbursement policies, which was commissioned by the Congress in 1973 (37). Studies of cost are inevitably confounded by the joint product dilemma; that is, medical care services to patients and the education of residents are inextricably intertwined. Analyses are frequently confused by efforts to judge whether or not graduate medical education produces an add-on cost or a financial gain for teaching hospitals. Examples of costs engendered by graduate programs include resident stipends and fringe benefits; compensation for faculty; special educational opportunities, such as visiting professors and travel by residents to meetings; charges for accreditation reviews; educational resources such as libraries, conference rooms, and audiovisual support; and provision of the support services necessary to accomplish educational goals.

When the costs of medical and surgical services in teaching and nonteaching hospitals are compared, the question often arises whether or not graduate medical education interferes with productivity, which is usually measured in length of hospital stay or number of patients seen per unit of time in clinics. Such simple comparisons—which generally impute an additional cost to graduate medical education—do not usually take into account the severity of illness, the case mix, and the complex, specialized services that are more likely to be provided by teaching hospitals. In defending against criticisms of higher costs and impaired productivity, medical educators and teaching hospital administrators advance arguments about the patient services provided by residents and the better quality of care provided by graduate faculties and residents. These criticisms and arguments and the studies to support one view or another confound the central point. Graduate medical education must be provided. Institutions that have both an educational mission and a patient care mission have and should have different characteristics from institutions with only a patient care mission. Financing strategies should support graduate medical education of high quality and its essential institutions and should provide opportunities for adjustment and innovation. It is accepted that those who pay the costs of graduate medical education should expect those responsible for graduate medical education to be prudent in the management of funds and scrupulous in their judgments about sources of revenue and the allocation of expenditures.

Sources of Financing

Graduate medical education originated as a hospital-based apprenticeship, and its costs have traditionally been accepted as a hospital cost. Public, Veterans Administration, and military hospitals all budget for the costs of graduate medical education in their appropriations requests. Third-party insurers allow payment for the costs of accredited medical education in teaching hospitals. In 1965 this policy was endorsed by statute in the enactment of Medicare and Medicaid. These federal programs allow reimbursement for the reasonable costs of graduate medical education.

In fiscal year 1978–79, the Council of Teaching Hospitals' survey of member hospitals identified sources of revenue for resident and clinical fellow education and training. About 75 percent of the cost of residency programs and slightly over 50 percent of the cost of clinical fellowships in nonfederal hospitals were financed from hospitals' general operating revenues—in other words, undifferentiated payments to these hospitals to reimburse both their patient care and educational costs. Special funds appropriated by states and municipalities accounted for an additional 11 percent of residency funding but only 3.3 percent of fellowship funding. Medical school support was only 2.7 percent for residents and 4.6 percent for fellows. The National Institutes of Health and other federal agencies, exclusive of the Veterans Administration, picked up almost 16 percent of the fellowship stipends but only 1.5 percent of residency costs. Endowments, foundations, and voluntary agencies were significant factors (7.1 percent) in financing fellowships but negligible factors in residency support (26). It is a reasonable presumption that the majority of teaching hospitals not members of the Council of Teaching Hospitals had somewhat less access to governmental and medical school dollars for financing residency programs. On a national basis, therefore, hospital revenues may account for over 75 percent of all graduate medical education financing, exclusive of the Veterans Administration hospitals.

The Veterans Administration is a major participant in graduate medical education. With 134 hospitals and 38 clinics affiliated with 103 medical schools, the Veterans Administration supports over 7,000 full-time equivalent resident training positions of the nearly 70,000 available. Its direct stipend and fringe benefit outlays are more than $135 million annually. Yearly, 25 percent of all residents spend some time in Veterans Administration programs and are supported from Veterans Administration funds.

Although graduate medical education is financed through multiple sources, the major source of revenue to pay for its costs comes from third-party insurer reimbursements to teaching hospitals. Should future financing policies be built upon continuing this practice or should an alternative approach be sought? Considering the essential relationship between graduate medical education and the provision of medical services, it is difficult to conceptualize a financing system for graduate medical education that would be separate and distinct from financing medical services in these institutions.

It is argued that patients should not pay educational costs. This view neglects two facts: patients benefit from the services they receive when residents participate in their care in teaching hospitals, and 94 percent of all hospital revenues are now derived from third-party insurers (37). These insurers—whether voluntary, nonprofit agencies (such as Blue Cross and Blue Shield) or commercial underwriters or federal programs (such as Medicare and Medicaid)—diffuse the educational costs throughout the population through their premium charges or taxation. These insurers have a social obligation to support graduate medical education, for the education and training of future practitioners is an essential investment by the public provided through private health insurance and government programs. This investment ensures that the medical care needs of future generations will be met.

This argument for the continuation of the practice of paying the cost of graduate medical education as a part of patient care costs should be considered in light of a discussion of potential alternatives. One alternative is to pay for graduate medical education from a separate fund. Such a fund could be generated by governmental appropriation of tax dollars. The magnitude of such a fund and the complexities of the management of its disbursements make this alternative an unrealistic option for long-term financing. Some support is currently provided by federal and state governments for residency and fellowship programs in which the public has a special interest. This support is currently focused principally on the development and maintenance of residency programs in the primary care specialties. This supplementary support of graduate medical education for special purposes by earmarked government funds is appropriate and should continue, but a single fund for graduate medical education from government appropriations is not a practical national alternative.

Another possibility is to transfer the obligation for financing graduate medical education to medical schools. To a large extent, the schools and their faculties now pay part of the costs of graduate medical education. Many program directors and graduate faculty members are salaried from medical school budgets. Faculty practice plans for the disposition of professional fee income generally provide support for graduate medical education in two ways: they augment faculty salaries in order to maintain reasonable parity of income with physicians who only practice medicine, and they provide special funds for educational enrichment. If medical schools were required to assume the total financial burden of graduate medical education, their only sources of revenue would be appropriated tax dollars or philanthropy. The former, as discussed earlier, is an impractical source, and the latter would be insufficient.

A third approach for financing graduate medical education is from revenue generated by physicians. A few large group practice clinics in the United States have traditionally paid residents' stipends from clinic income. For these groups, this arrangement has been satisfactory. Physicians who have voluntarily joined the groups have accepted their educational missions and the fiscal policies to support them. However, in the main, teaching hospital staffs consist of a mix of private practicing physicians who manage their own professional fee income and are not remunerated for their faculty services, private practicing physicians whose income is derived principally from professional fees but who receive part-time payment (either cash or on-site office facilities) for their faculty services, and full-time salaried physicians whose incomes may or may not be augmented by revenues generated by professional fees through a faculty practice plan. This complex mix of income sources for most teaching hospital staffs makes impossible the implementation of a simple policy that graduate medical education should be totally paid for by teaching physicians. The contributions made by volunteer faculty and by faculty who share their incomes with the institutions through practice plans should be recognized, and their contributions should be encouraged; but as a sole or major source of revenue for the support of graduate medical education, financing by teaching physicians is not practical. Taxing physicians for residency training might have the effect of driving away many physicians who admit their patients to teaching hospitals, or they might attempt to recover the costs of supporting graduate medical education by increasing their fees. This would simply shift the responsibility of payment from hospital reimbursement sources to professional service reimbursement sources.

A final consideration is that residents pay for their own graduate medical education. There is a growing public belief that because physicians as a group have a very high income-earning potential, their education should not be subsidized. An increasingly popular view is that undergraduate medical students should pay for education through tuition. Scholarship support is becoming more and more difficult to obtain, and medical student loan programs, although available, rather than subsidizing students, place a heavy and progressively increasing repayment burden upon them. Why should residents not continue to pay for their medical education through increasing their indebtedness and foregoing income until they have completed their education and training requirements for specialty certification? This question raises many significant educational and public policy issues.

The Liaison Committee on Medical Education, which accredits medical schools, has officially stated that graduating students are not prepared to practice independently without supplementing their education by a period of graduate training, the length of which will depend upon the type of practice students select (6). The specialty boards, which set the standards for education and training in the medical and surgical specialties, have established minimum periods of training, the shortest of which is three years. State licensing laws and regulations permit graduates of accredited schools to be licensed either upon graduation or upon completion of one year of graduate training. In effect, the educational policy holds that medical students are not prepared to practice until they have completed specialty certification requirements while the licensing policy holds that they are prepared to practice after no or, at most, one year of graduate training. Were residents charged tuition and provided no subsistence, their opportunities to pursue graduate medical education would vary depending upon their financial resources and their ability or willingness to assume growing burdens of debt. Most would probably have no choice except to enter practice before completing the graduate medical education deemed optimal by medical educators and specialty boards.

The continuing argument over whether residents are students or employees and whether their compensation is payment for their services or a stipend in support of their education becomes inconsequential when examined from the standpoint of public expectations and medical education policy. The public expects medical educators to prepare proficient practitioners who are capable of continued professional development. Medical educators and specialty boards have determined that three or more years of graduate training are needed to accomplish this. Licensing policies permit practice before attainment of the expected educational level. Placing the burden of financing their education on residents would force them into practice before they are prepared. It is apparent that the policy of providing an adequate stipend to residents should be continued unless there is a change in public expectations and educational policy that eliminates or significantly shortens graduate medical education or unless there is a change toward licensing for independent practice only upon completion of the graduate medical education requirements established by medical educators and specialty boards.

The foregoing discussions of the reasons for financing graduate medical education and the potential sources for its financing lead to the following recommendations.

The Association of American Medical Colleges, its constituent institutions and societies, and the specialty boards, the Liaison Committee on Medical Education, the Liaison Committee on Graduate Medical Education, and their sponsoring professional organizations should reaffirm that the graduate phase *of medical education is essential for the preparation of proficient practitioners capable of continued professional development.*

This reaffirmation should be examined closely by both private and public third-party payers, and conceptual confusions or disagreements should be resolved through discussion with medical educators, their national organizations, and their institutions.

Graduate medical education should continue to be financed from multiple sources, with the principal source being the general operating revenues of teaching hospitals.

The financing of special educational initiatives in graduate medical education from a variety of sources should be encouraged. These initiatives include programs in new and developing specialties, programs to achieve local or regional objectives, and programs to prepare clinical investigators and medical educators. Special initiatives should be supported through grants from private, voluntary agencies and from federal and state governments.

The special financial needs of teaching hospitals should be clearly delineated and recognized. These include the costs of resident stipends and faculty compensation and the costs of providing educational resources and support services.

Special Issues

If medical educators, their institutions, and those who assume responsibility for financing graduate medical education agree that stable funding policies for graduate medical education should be intertwined with payment policies for medical and hospital services, several special problems must be solved. These are: (*a*) compensating teaching physicians; (*b*) adjusting the mix and size of specialty programs through financing policy; (*c*) financing ambulatory care educational settings; (*d*) financing graduate education in preventive medicine; and (*e*) containing the cost of graduate medical education.

COMPENSATING TEACHING PHYSICIANS

The movement toward the philosophy that there should be a one-class medical service system in the United States and the involvement of private and government third-party payers in the reimbursement for medical services and education have created enormously complex and still unresolved problems regarding the compensation of graduate medical faculties, the provision of stipends to residents, and their joint patient care and educational responsibilities.

The Medicare program finances the reasonable costs of graduate medical education by providing resident stipends and payment for supervision of residents by medical faculty under Part A and pays, under specified conditions, for professional medical services by teaching physicians to Medicare beneficiaries through Part B. The complexity of the payment program and uncertainties in administrative policy in the early years of the program led to an investigation by the General Accounting Office of the cost accounting and billing practices of teaching physicians and teaching hospitals in 1969. Teaching hospitals and faculties were charged with two principal abuses: billing professional fees for services not personally performed by the faculty and billing professional fees for patient services provided by faculty members who were already compensated through payments to hospitals under Part A. Since the airing of these charges, teaching hospitals and their staffs have largely eliminated such abuses, but efforts to impose special restrictions on the reimbursement of faculty and teaching hospitals continue.

Another problem has been the level of the fee that should be paid for physicians' services in teaching hospitals. Resolution of these issues is urgently needed. The following principles should be the basis for policies involved with the compensation of teaching physicians.

1. In a teaching hospital, if the level of professional medical services provided a patient by the physician and documented in the hospital record is equivalent to the level of service furnished a private patient in a nonteaching hospital, then the physician in the teaching hospital should be eligible for fee-for-service payment on a reasonable charge basis.

2. Hospital administrators and medical faculties have the responsibility to ensure that care is of high quality and that physicians who submit bills for professional services have personally directed the care of the patient. Their ethical standards in adhering to this principle must be impeccable.

3. Third-party payers should not pay twice for a single service. Refuting the contention that physician teachers who are paid through hospital reimbursement for their educational and supervisory services are double billing if they seek payment for their personal contributions to the professional care of patients will depend on more precise descriptions of the educational and supervisory activities that are paid for through hospital reimbursement. These descriptions should be developed by local administrators and faculty and reviewed and approved by third-party payers. There is a significant institutional responsibility to be sure that fees for professional services are not billed for time and effort that are simultaneously financed by a hospital salary for education or supervision.

4. The determination of the amount of payment for professional services provided to a beneficiary should not depend upon whether other patients who are not beneficiaries, and who do not have the same resources for the payment of professional fees, are cared for at a lesser or no charge. The contention that the teaching staffs in institutions that historically have provided medical care to indigent patients should not be permitted to collect in full for professional services to Medicare beneficiaries denies that one-class medical care is a societal goal. If physicians who provide professional medical services in teaching hospitals at a private standard of care are required to accept fee levels that are substantially below local prevailing rates, these physicians will have an incentive to discontinue admitting paying patients to these hospitals. This pattern of admission practices will result in all paying patients being admitted to one hospital while nonpaying patients are admitted to another—most likely an urban teaching hospital (most likely, but not always, publicly owned). This result would be a step backward in the effort to achieve a single class of care—a goal toward which significant progress has been made since the Medicare and Medicaid programs were enacted in 1965.

Third-party payers concerned with reimbursement policies related to the compensation of physicians in the teaching setting should adopt the foregoing principles.

Teaching hospitals and medical school administrators and their faculties should adopt these principles and assess whether or not their policies and practices are commensurate with prudent management and acceptable ethical standards. Where deviations are found, policies should be changed and the fac-

ulty should be informed of discrepancies.

MIX AND SIZE OF SPECIALTY PROGRAMS

The type and number of specialists prepared for practice through graduate medical education are issues. The availability of opportunities for education and training in one specialty or another can limit the options of medical school graduates by increasing the competition for positions in specialties with fewer positions and opening opportunities for obtaining training positions in specialties with expanded programs.

The issues related to the role of graduate medical education in modifying specialty distribution and the practice of specialty medicine are detailed in the chapter on specialty distribution. This discussion is limited to how financing could influence the availability of positions in the various specialties and modify the mix and size of graduate medical education programs.

Since World War II, the total number of graduate medical education positions offered has been in excess of the number of graduating U.S. medical students. Thus, career choice, for the most part, has not been limited by the availability of training positions in a specialty. With the number of medical school graduates increasing each year, and now approaching 16,000, the ratio between the number of U.S. graduates and the number of available positions has sharply decreased. According to the National Resident Matching Program, in 1970 the ratio was 1:1.8; in 1979 the ratio was 1:1.3. Increasing competition for graduate medical education positions has resulted. Students no longer are able to count on obtaining a position in a program of the specialty of their choice. This situation lends itself to changing the output of physician specialists by manipulating the mix of available training positions in the various specialties.

There are two possible approaches to using financing to change the mix and size of specialty programs in graduate medical education. These are to provide earmarked special funds for programs that are to be expanded and to restrict funding for programs in specialties that are to be reduced.

The practice of encouraging the initiation or expansion of programs through providing special funds for them is longstanding. Institutions are generally afforded the option of whether they will or will not respond to the special program initiatives, and there is little dispute over whether such financial incentives by government or private agencies are appropriate. Debates do occur over whether or not the requirements for gaining funding are too restrictive, whether or not the funding provided is adequate to meet program costs, and whether or not the short-term nature of most special funding makes the long-term maintenance of new or expanded programs feasible.

Financing policies that would restrict funding for residency programs in specialties deemed to have an excessive number of practitioners have been proposed and discussed but not invoked. Reducing the support for programs in such specialties by reimbursing teaching hospitals at a rate below the actual educational costs would probably diminish their educational quality but would not necessarily decrease the number of positions offered. Reducing support for some programs will not necessarily provide adequate financial resources to expand or develop programs in other specialties. This complex problem is discussed at greater length in the chapter on specialty distribution.

Complementing the reduction of reimbursement below cost for certain programs with reimbursement above cost for other programs could provide an incentive for teaching institutions to change the mix and size of their programs. To a degree, this is now accomplished through the special initiative funding programs discussed earlier. During the past decade, these programs caused an increase in primary care residencies and a plateau, albeit not a dramatic decrease, in the number of positions available in the other specialties.

Another financing policy should be considered. In the chapter on specialty distribution, it is pointed out that there is a growing trend for academic medical centers to consider that their graduate medical education programs should involve greater institutional responsibility for the mix and size of their graduate programs. Special financial incentives to academic centers and teaching hospitals to develop and implement mechanisms to adapt their programs to local, regional, and national manpower needs could be provided through grants.

> *Expansion of opportunities for graduate medical education in specialties deemed in short supply should continue to be encouraged by establishing financial incentive programs. Special funding should provide sufficient support to meet the cost of program development and maintenance and should not be so restrictive that it inhibits desirable innovations.*

AMBULATORY EDUCATIONAL SETTINGS

Graduate medical education is conventionally considered to be hospital-based. The terms "resident" and "residency" derive from the era when physicians-in-training were expected to be residents in the hospital as distinguished from their attending physician mentors who maintained private offices and visited the hospital to supervise and teach the resident physicians. Consequently, the attention and interest of both attending physicians and resident physicians focused on teaching and learning through caring for hospitalized patients. This still obtains and is still appropriate for graduate medical education programs in many specialties. Education and training in surgery, surgical specialties, and many medical and pediatric subspecialties are principally concerned with residents' acquiring the knowledge and skills to care for patients who must be hospitalized in the course of their care. These specialties use ambulatory clinics principally to assess patients prior to admission and to follow them for limited periods after admission. However, for other specialties—particularly for those with the goal of educating and training generalist physicians who will provide comprehensive, continuing care to patients who need not actually be hospitalized—the hospital-based resident physician concept of graduate medical education provides only part of the educational experience that is essential to their preparation. Ambulatory educational settings, in which patients with problems and complaints that do not commonly require hospitalization or those with chronic diseases that necessitate long-term care, are an essential resource. Their adequate development poses organizational and financial problems.

In the era when most medical educational settings were limited to where medical care was provided to indigents, the outpatient clinics of hospitals devoted to the care of charity patients were financed as part of the cost of hospital operations through tax appropriations to the institution or through philanthropy. Patients paid nothing or only a nominal fee. The outpatient clinics provided medical services both to patients who had to be hospitalized and those who did not require hospitalization, but there was little emphasis on comprehensive or continuing care. Both attending and resident physicians viewed service in the clinics as obligatory and necessary, but slight attention was paid to teaching the concepts or acquiring the skills to conduct a practice that would be principally office-based. These clinics did not compete with private physicians for fee-paying patients. They generally had more patients than they could care for effectively with the resources available.

To promote the development of the ambulatory graduate medical educational settings that are needed to teach residents how to care for patients requiring comprehensive and continuing care, adequate financial resources must be provided. Presently, the revenues generated in these settings are not adequate to support their patient care and educational missions. Mandatory cost allocation methods, a large number of unsponsored, indigent patients, and the lower productivity imposed by educational activities all make clinic financial support inadequate and threaten the viability of such outpatient services.

Allocation of costs—The ambulatory clinics for most graduate medical programs are housed in facilities owned and operated by teaching hospitals. Ancillary services such as laboratory and radiography are provided by the hospital's laboratory and X-ray departments. These and other departments that provide ancillary services are staffed, equipped, and managed principally to serve the requirements of hospitalized patients. They offer complex and sophisticated services on a 24-hour-a-day basis. Caring for most outpatients requires neither support services of this complexity and sophistication nor 24-hour availability. However, reimbursement policies of third-party payers—Medicare intermediaries in particular—make it difficult to negotiate different rates for ancillary services provided to outpatients as compared with inpatients. This means that ancillary services for the ambulatory clinics of teaching hospitals are more expensive than similar services provided by private physicians in their offices or provided by ancillary service facilities devoted solely to ambulatory patients in the community.

Cost-finding methods required by private and public payers burden teaching hospital outpatient facilities with allocations that exceed the actual costs for services and resources. For example, most clinic spaces are utilized eight hours a day, but allocation of their costs for housekeeping and maintenance are based upon 24-hour-a-day utilization.

These practices and their attendant reimbursement policies drive up the costs and prices of outpatient care in teaching institutions and make their ambulatory clinics noncompetitive with other community facilities. Patients who must pay their own way for outpatient care are reluctant to attend more expensive teaching clinics, and third-party payers are increasingly sensitive to paying base rates and ancillary service costs higher than those prevailing in the community.

Two possible approaches could solve this problem: (*a*) cost allocation practices and reimbursement policies could be changed so that teaching hospital ambulatory clinics are burdened only with the costs of the services that they need or utilize; or (*b*) teaching hospital-operated ambulatory clinics could be organized with support facilities and management systems that are suited to their special needs. Either approach would have the effect of raising the daily rates and costs of ancillary services for inpatients in teaching hospitals.

> *Third-party payers should restructure cost allocation methods and reimbursement policies to provide a financial incentive for residents' involvement in ambulatory care.*

Unsponsored indigent patients—Historically, teaching clinics provided medical services to patients who were unable independently to pay for medical care and who had no health insurance coverage. This is often still the case; and since adequate insurance coverage for outpatient services is less common than for inpatient services, many teaching clinic patients cannot provide a source of revenue for their care. Providing effective care to indigents is generally more expensive than to more affluent patients because of greater severity and chronicity of illness and difficulty in achieving compliance with therapeutic regimens. In order that these teaching clinics can accomplish both their patient care and educational missions, government subsidies are needed.

> *Teaching clinics with patient populations consisting of a large number of patients without resources to pay for their care should be subsidized by public agencies at a rate sufficient to ensure their accomplishing both their patient care and educational missions.*

Productivity—Modifications of cost allocation methods and subsidies for unsponsored patients cared for in a teaching hospital's ambulatory clinics can be better justified if the institution and its faculty utilize available personnel and resources effectively and thereby make the clinics as productive as possible. In graduate medical education teaching settings, productivity must be measured from the standpoints of both patient care and education. In ambulatory clinics, patient care productivity is measured by the length of time patients must spend to be cared for and by the number of patients seen per unit of time. Educational productivity is difficult to measure and ultimately depends upon demonstrating that residents achieve the knowledge, skills, and clinical judgment needed to make them proficient practitioners of their specialty. In both inpatient and outpatient settings, residents must be given time to interview and examine their patients, integrate their findings, arrive at decisions, and order and perform diagnostic and therapeutic procedures. In ambulatory teaching clinics, there is always time pressure. Revenue to support teaching clinics is dependent upon the number of patients seen per unit of time. As a result, the time allowed may not be sufficient to permit the desired level of learning.

It is difficult to estimate how much additional time is required to care for a patient in a teaching clinic as compared with a nonteaching clinic purely because residents need to be given adequate time to benefit educationally from their patient contacts. There is agreement that junior, less sophisticated and less skilled residents require a longer time with their patients than more senior residents. A well organized clinic, staffed by junior and senior residents and an effective supervising faculty, can be quite productive, but rarely can a teaching clinic equal the productivity of a nonteaching clinic. Minimizing the loss in productivity requires rigorous attention to organizational detail, a clear understanding of and agreement with the goals of education in the ambulatory clinic, and the provision of appropriate ancillary services without unnecessary delay.

> *Graduate medical education faculties should develop and articulate the educational goals to be accomplished in ambulatory teaching settings. Clinics should be organized, staffed, and managed to minimize loss of patient care productivity while still allowing sufficient time for residents to attain the educational goals.*

Financial support—The financial support of ambulatory teaching clinics is increasingly dependent upon revenues generated through payments by third-party insurers. This is particularly true of clinics devoted to establishing an educational environment for teaching residents to provide continuing, comprehensive care to patients who do not need to be hospitalized. Such clinics must attract and hold a population of patients dependent upon the clinics for their ongoing care and willing to participate in their educational missions. The clinics also must establish a mode of operation that will provide residents with experience in organizing ambulatory care in an effective and efficient way. To accomplish this, teaching clinics should be reasonably competitive with nonteaching clinics. As previously described, the competitiveness of ambulatory clinics is significantly handicapped by cost allocation methods, by unsponsored, indigent patients, and by the impact of education on clinic productivity. Each of these problems increases the cost and price of ambulatory services. Even if cost allocation methods are changed and indigent patients are reimbursed for care paid for, the added educational mission will result in teaching clinic costs that exceed the charges made by office-based practitioners. Governmental and private insurance programs should recognize and pay these costs.

Third-party payers should pay for the care provided to their beneficiaries in teaching clinics and also pay reasonable educational costs.

Until those reforms are accomplished, the need for special subsidies for teaching clinics must be considered. Special subsidies are now provided by both state and federal governments and private foundations to stimulate the development of primary care residency programs. These programs are absolutely dependent upon effective ambulatory educational settings. Subsidies help offset costs engendered by reduced productivity, support special services and personnel needed to demonstrate and teach optimal approaches to patient care, and permit residents to acquire skills in assessing patient needs and in counseling them without the excessive utilization of diagnostic and therapeutic procedures. As mentioned earlier, impaired productivity, as measured by the number of patients seen per unit, should be minimized by attention to organization and staffing. The appropriateness and density of special services and personnel not usually available in practitioners' offices should be scrutinized and not exceed that needed to accomplish agreed-upon educational goals. The problem with teaching residents to be judicious in their utilization of procedures and generous in their utilization of time in employing their clinical skills to evaluate and counsel patients is directly related to the prevailing policy of reimbursing much more generously for procedures than for time spent with patients. This problem is discussed at length in the chapter on specialty distribution.

Health maintenance organizations have been slow to accommodate graduate medical education in their ambulatory settings. These prepaid clinics, which must negotiate with their subscribers on a prospective cost basis, have viewed assuming an educational mission as adding a financial burden too great to allow them to compete with indemnity insurance plans which reimburse for hospital costs and usual, customary, and reasonable professional fees. This reluctance is regrettable because it denies access to a valuable educational resource for graduate medical education and denies residents the opportunity of learning to care for patients on the basis of prepayment rather than on the basis of a fee for services rendered.

The financial problems posed for health maintenance organizations by assuming an educational mission should be analyzed, and financial policies that will promote the development of graduate medical education programs should be adopted.

Reimbursement policies for payment of fees for professional services by faculty in teaching clinics pose a special problem. Clinics in which residents are taught to provide comprehensive, continuing care to patients must establish a milieu in which patients view residents as their personal physicians. Faculty members must, on the one hand, ensure that residents are supervised, are guided, and learn from their patient contacts while, on the other, they must encourage the development of personal relationships between residents and patients. Under these circumstances, patients may not view or recognize faculty members as their identifiable personal physicians. Under the rule established by the Social Security Administration's Intermediary Letter No. 372 for Medicare reimbursement, a faculty member must be personally identifiable as a beneficiary's personal physician. This requirement, which does not interfere with education in most instances in the hospital, does interfere with education in the clinic.

Faculty supervisors and residents should develop modes of interaction that ensure that supervisors contribute to the care of patients and exercise personal control over decisions about the management of patients. In a clinic that requires residents to establish long-term relationships with patients in order that they may develop skills in providing continuity of care, faculty who make direct contributions to the care of patients should be eligible for reimbursement by third-party payers for their professional services, even though patients may identify primarily with the resident. Faculty providing educational and supervisory services should be paid for these efforts on a cost basis through reimbursement to the clinic rather than through charges for professional services.

PREVENTIVE MEDICINE

Graduate medical education in preventive medicine—general preventive medicine, public health, occupational medicine, and aerospace medicine—is different from education for all other specialties. The attainment of the knowledge and skills needed to be proficient in these specialty areas does not require direct involvement with the care of patients in the hospital or conventional outpatient clinics. This separation of preventive medicine from hospital services means that programs in preventive medicine do not have access to the funds generated by hospitals to support their educational costs.

In a recent report by the American College of Preventive Medicine (38), the source of financing for programs was delineated. The total amount of support for 22 general preventive medicine residencies in 1979–80 was $1,751,480. Sources of funds were university general funds, 38 percent; federal funds (distributed among seven different categories), 36 percent; state general funds, 18 percent; private foundations, 5 percent; industry, 1 percent; and all others, 2 percent. Ten public health residency programs reported that 75 percent of their total of $182,119 came from state funds. For occupational medicine, 10 programs reported that 71 percent of their $1,412,914 of support came from National Institute of Occupational Safety and Health Educational Resource Center grants. Aerospace medicine residency programs and federally operated programs wholly funded by the government were excluded from the analysis.

The financing of preventive medicine, public health, and occupational medicine residency programs is much more dependent upon direct support from public agencies, both state and federal, than are programs in other specialties. This dependence places a special responsibility on these agencies to ensure that program support is adequate both to provide the number of positions needed and to permit a quality of education that will attract young physicians into this career area. There is increasing national concern with the need to place more emphasis on preventive measures in the personal health of individuals and to protect susceptible populations from environmental health hazards. The Graduate Medical Education National Advisory Committee predicts a significant shortfall in physicians in all areas of preventive medicine in 1990. The rising expectation that prevention of disease should be of higher priority, coupled with the anticipated shortage of preventive medicine specialists, constitutes a challenge to both the public and private sector. Greater resources for graduate medical education programs in preventive medicine will be needed to meet this challenge.

CONTAINING THE COST OF GME

Containing the cost of graduate medical education should be approached at both national and local levels. At the national level, certifying boards and residency review committees should pay particular attention to the costs of modifications in certification requirements and the standards for program accreditation. The American Board of Medical Specialties and the Liaison Committee on Graduate Medical Education have instituted policies requiring certifying boards and residency review committees to provide analyses of the effect of changes in their specifications on educational quality and cost. This policy should continue and should be implemented effectively.

Only institutions with accredited programs in graduate medical education should be eligible for reimbursement for their educational programs. Financing graduate education in substandard programs is a poor investment and an unjustifiable expenditure. The chapter on National Standards Formulation and Accreditation contains recommendations to improve the accreditation of graduate medical education.

The evolution of new specialties, specialty boards, and training programs to prepare new types of specialists increases the cost of graduate medical education. In this era, the impetus to promote the development of new specialties has come, in part, from government. Through special appropriations, training programs in new specialties have been initiated, usually without consideration of their long-term cost implications and their need for future stable funding. The Coordinating Council on Medical Education sought to establish a mechanism so that proposals for new specialties and specialty boards are thoroughly scrutinized from the standpoint of both the appropriateness of specialty status and societal needs. The private sector should proceed with this effort and should attempt to assess the impact of the introduction of new specialties on the cost of graduate medical education.

> *Proposals to change certification requirements or accreditation standards in graduate medical education should be evaluated to determine their effect on both educational quality and cost.*
>
> *Proposals to initiate new types of training programs and develop new specialties should be considered from the standpoints of their effect on medical services and their effect on the cost of graduate medical education.*

At the local level, institutions that sponsor graduate medical education programs should develop internal mechanisms to assess the extent to which their educational resources are used effectively and their programs meet the principal goal of graduate medical education and whether the organization and staffing of their teaching services promote both acceptable patient care and educational productivity. Program directors and graduate medical faculties should expect to justify their expenditures of resources and demonstrate that their programs are providing the education and training needed by residents to accomplish the goals of graduate medical education.

As academic medical centers expand their programs, hospitals and clinics not previously involved in graduate medical education are becoming engaged with an educational as well as a patient care mission. This utilization of existing facilities, rather than construction of new facilities, is a cost saving. In negotiating with hospitals and clinics, academic centers should attempt to ensure that these facilities provide effective educational settings at a reasonable cost. It is unlikely that the utilization of such facilities will save much money beyond that saved by eliminating capital investments. Programs that meet acceptable standards must pay for the educational costs detailed earlier. These costs do not differ much across institutional settings.

Effective cost containment for medical and hospital services goes beyond concerns about the cost of graduate medical education. It is essential that residents be taught to utilize the growing armamentarium of useful and effective diagnostic and therapeutic technological procedures in a manner that provides optimal patient care at the least cost. An emphasis on cost containment during graduate medical education should have lasting impact upon the approaches residents will use when they become independent practitioners. At present, many teaching hospitals involve residents in audit committees and hold teaching rounds that emphasize the cost differences in applying available resources to patient care problems. Teaching hospitals should engage in and promote research directed toward the cost effective use of medical care resources. In addition, graduate faculty members should make conscious efforts to demonstrate to the residents they supervise that technological procedures should be employed only when they provide a justifiable benefit to patients.

> *Medical schools and their associated teaching hospitals should develop internal mechanisms to determine whether their educational resources are effectively used.*
>
> *In developing new educational settings in hospitals and clinics not previously engaged in education, academic centers should attempt to ensure that effective programs are achieved at a reasonable cost.*
>
> *Teaching hospitals should increase their emphasis on research related to the effective use of resources and educating residents to utilize diagnostic and therapeutic procedures with due consideration of their contributions to optimal patient care and their costs.*

Future Changes

The financing and organization of the medical care field is in an evolutionary stage. Starting from the era when most physicians provided their services as solo practitioners and patients paid both professional and hospital expenses out-of-pocket, it has progressed to the point where group practices are common and both professional fees and hospital expenses are in large measure paid by third-party payers. Some anticipate universal health insurance in the future.

Changes in the financing and organization of medical care that have already occurred provide signals of potential problems for the financing of graduate medical education in the future. As mentioned above, health maintenance organizations have been reluctant to become engaged in graduate medical education because their productivity is impaired with an involvement with education.

Investor-owned hospitals are also unwilling to provide graduate medical education. There has been a substantial growth in the number of beds operated by investor-owned hospitals and in the number of hospital management corporations (39). These new organizations are able to provide medical services at an attractive price utilizing the professional services of fully prepared physicians who have been educated and trained elsewhere in the system. Under present financing policies, they have little reason to become involved in graduate medical education.

In the future, it is likely that an increasing proportion of medical services will be provided by large organizations, both investor-owned and nonprofit, which, because of their limited patient care mission, their avoidance of research and development, and their lack of involvement with medical education, are able to price their services below those of the teaching hospitals that are the essential institutions for graduate medical education.

Providers of medical service are increasingly attempting to control costs by promoting competitive pricing. Proposals to stimulate competition and reduce reliance upon regulation for cost control have thus far not dealt realistically with the continued support of teaching hospitals and their special educational and research missions. Those responsible for determining financing policies and for the provision of graduate medical education must recognize that these developments pose a significant threat to the maintenance of adequate resources for graduate medical education. As strategies to promote competition evolve, policymakers must be acutely aware of the need to preserve the institutions that provide graduate medical education and ensure that the level of educational quality, patient care, and scholarly inquiry expected of them is not subverted by the desire to effect short-term savings.

Conference Discussion

Dr. Edward Stemmler reported for the six groups of 71 individuals who discussed the financing of graduate medical education.

He restated the position of the Working Group on Financing Graduate Medical Education that the funding of graduate medical education through the general operating revenues of teaching hospitals should continue. The conference discussion groups were pleased to note the statement basically supporting this position which Mr. Walter J. McNerney, president of the Blue Cross and Blue Shield associations, sent to the Association of American Medical Colleges for inclusion in the conference agenda. In the discussion groups, similar expressions of support were offered on this point by representatives of the commercial insurance carriers.

The discussions generally reaffirmed the emphasis that was placed on the maintenance of multiple funding sources. There was agreement that because medical insurance is ubiquitous, payment of the costs of graduate medical education from health insurance funds distributes its support fairly across the population.

Conferees expressed concerns about the long-term prospects for maintaining stable funding for graduate medical education. Regulatory efforts by the federal government during the past decade to control Medicare and Medicaid expenditures have significantly threatened the financing of teaching hospitals. New initiatives to promote price competitive marketing of medical services were viewed as a potential threat to the support of graduate medical education because hospitals and physicians not engaged in teaching will be able to price their services below those provided by teaching hospitals and their faculties. If major purchasers of medical services opt to use providers not involved in education, teaching hospitals could be seriously impaired in their ability to accomplish their educational mission.

The options of supporting graduate medical education with professional fee income or having the residents bear the cost of their own education were discussed, but for many of the reasons presented by the working group they could not be developed to a point of viable implementation.

The possibility of supporting graduate medical education through a separate fund derived from tax revenues was explored. Money for such a fund could be derived either from general federal revenues or from a surcharge on payments for medical services.

Finally, conferees expressed the view that the report neglected the need for special resources to support the education of clinical investigators. Research training grant stipends now provided to residents who desire to develop their investigative skills frequently require that aspirants to an academic career take a reduction in income during this period of their preparation. This lack of strong financial support for future clinical investigative talent was deplored.

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* Also a member of the AAMC Task Force on Graduate Medical Education.

Conclusion

The decision by the Association of American Medical Colleges to undertake a major review of the status of graduate medical education in the United States proved to be timely. During the three years that the Task Force on Graduate Medical Education and its five Working Groups deliberated and developed the concepts and recommendations contained in the report, there were many opportunities for interaction with other groups and agencies that impinge on the complex environment of graduate medical education. As a result, implementation of several task force recommendations has already begun:

1. The Accreditation Council for Graduate Medical Education has incorporated the changes in residency program designations into the General Requirements section of the "Essentials of Accredited Residencies." This will establish a transitional first-year program for students who desire a broad clinical year before entering a narrow specialty or who desire further clinical experience before deciding about their career direction.

2. The National Resident Matching Program has modified its policies and procedures to improve its services to both students and programs. The modifications will tend to reduce the pressures on students to make premature decisions about their graduate medical education.

3. Task force recommendations were, in part, instrumental in the transformation of the Liaison Committee on Graduate Medical Education into the Accreditation Council for Graduate Medical Education. The agreement by the sponsoring organizations to changes that will improve the staff support and ensure financial independence of the Accreditation Council for Graduate Medical Education will permit it to discharge its responsibilities more expeditiously. Although all of the task force recommendations relating to these areas were not specifically implemented, the changes are in a direction consistent with its views.

Fortuitously, the AAMC invitational conference on September 29–30, 1980, to discuss the report with 122 representatives from other organizations and agencies coincided with the public release of the summary report of the Graduate Medical Education National Advisory Committee. That federally appointed committee had been working concurrently to advise the Secretary of Health and Human Services about federal concerns with graduate medical education. The task force and working groups had shared information with the Graduate Medical Education National Advisory Committee. The coincidence of the release of the Graduate Medical Education National Advisory Committee report and the conference heightened the awareness of those involved with graduate medical education of the many issues that still must be resolved.

Graduate medical education in the United States is now a formal, structured period for the education and training of essentially all physicians who enter medical practice. It is as important as the undergraduate phase in the preparation of proficient practitioners capable of further professional development throughout their practicing careers. Graduate education also is an important stage in the development of competent clinical investigators and academicians. The provision of graduate medical education is now predominantly the responsibility of medical schools and associated teaching hospitals. The faculty for the graduate phase has become largely congruent with the faculty responsible for the undergraduate phase of medical education.

The organization of graduate medical education as disciplinary educational programs for the education and training of physicians to become qualified for certification as specialists by independent certifying boards is basically sound. However, this programmatic focus has caused an undesirable degree of insularity. In medical schools and teaching hospitals insufficient institutional attention is paid to the overall quality of graduate programs. The accreditation system has perpetuated this insularity by confining the assessment of the quality of graduate medical education to individual programs. The overall educational environment of the institutions that sponsor programs has not been sufficiently emphasized.

The transition between undergraduate and graduate medical education has become a complex problem for medical students, their advisers, and graduate program directors. The dearth of useful information about graduate programs available to medical students and the pressures of the process through which they obtain their residencies underlie the problem. The structure and content of the first graduate year and its relationship to the development of basic clinical skills by students during their undergraduate phase are also concerns. Implementation of the recommendations in Chapter 3 to improve the information and counseling available to students and to modify the selection process should reduce the frustrations of all concerned.

Graduate medical education is the period in which newly graduated physicians develop their careers as specialists. These range from specializing as generalists to subspecializing in fields that concentrate on an organ system or a disease process. Influencing the distribution of physicians among various specialties by changing graduate medical education is often viewed as an expedient approach to changing the characteristics of medical practice in the United States. In Chapter 5, the evolution of specialized medical practice is described, and the limited ability of graduate institutions to modify their programs to influence specialty distribution and medical practice is delineated. Institutional obligations to be responsive to the needs to modify the distribution and medical practice of specialists are discussed. The futility of attempting to change medical practice patterns solely by modifying the distribution of specialists being educated in graduate programs is emphasized. The incentives to specialized forms of medical practice are to a major degree established by reimbursement policies for professional services that now provide a premium to physicians who perform diagnostic and therapeutic procedures. Simultaneous and complementary changes are needed in reimbursement policies for professional services if changes in the mix and type of graduate positions to be made available are contemplated.

Graduate medical education is largely financed through third-party insurer reimbursements to teaching hospitals. Significant contributions to its financial support also derive from federal programs, such as the Veterans Administration, and by states and municipalities. In Chapter 6, it is recommended that graduate medical education continue to be funded through reimbursements to teaching hospitals as a reasonable investment by third-party insurers on the part of the public because well qualified physicians will be needed for future generations and because residents contribute to the quality of care in teaching hospitals. The task force focused on the complex issues that surround the financing of graduate medical education, the status of residents, the compensation of teaching physicians, the financial problems of ambulatory educational settings, the need for cost containment, and the potential effect of changes in the organization of medical care delivery.

Graduate medical education for all physicians is essential, and its provision is the responsibility of academic institutions. The task force's effort was directed not only to the academic community but also to the practicing physicians and the public and private agencies that support and shape the policies affecting graduate medical education. Through the continued implementation of the recommendations contained in this report, the organization, quality, and financial support of graduate medical education will be improved so that all U.S. medical school graduates can provide the quality and scope of medical care that the public expects.

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Appendix 1

Accreditation of Graduate Medical Education, 1981

In September 1980, after a series of conferences among the senior elected officers and chief executive officers of the American Board of Medical Specialties, American Medical Association, American Hospital Association, Association of American Medical Colleges, and Council of Medical Specialty Societies, the five organizations announced plans to reorganize the accreditation system to be effective January 1, 1981. The old organization and relationships are shown in Figure 1.1; the new organization and relationships are shown in Figure 1.2.

The Coordinating Council on Medical Education was abolished. In its place, the Council for Medical Affairs was established with representation by the two top elected officers and the chief executive officers of each organization. The Council for Medical Affairs provides a forum for discussion of medical education issues and other matters of mutual concern to the organizations. The Council for Medical Affairs has no direct role in accreditation policy.

The Liaison Committee on Graduate Medical Education was transformed into the Accreditation Council for Graduate Medical Education. Representation in the Accreditation Council for Graduate Medical Education is shown in Figure 1.2. Staff services are provided by the American Medical Association under the conditions of a letter of agreement. Revenues to pay for the cost of accreditation are generated by charges to programs. This is a combination of an annual charge based on the number of positions in a program and an additional charge for periodic review and accreditation. Parents of the Accreditation Council for Graduate Medical Education pay the cost of Accreditation Council for Graduate Medical Education meetings and policy development activities.

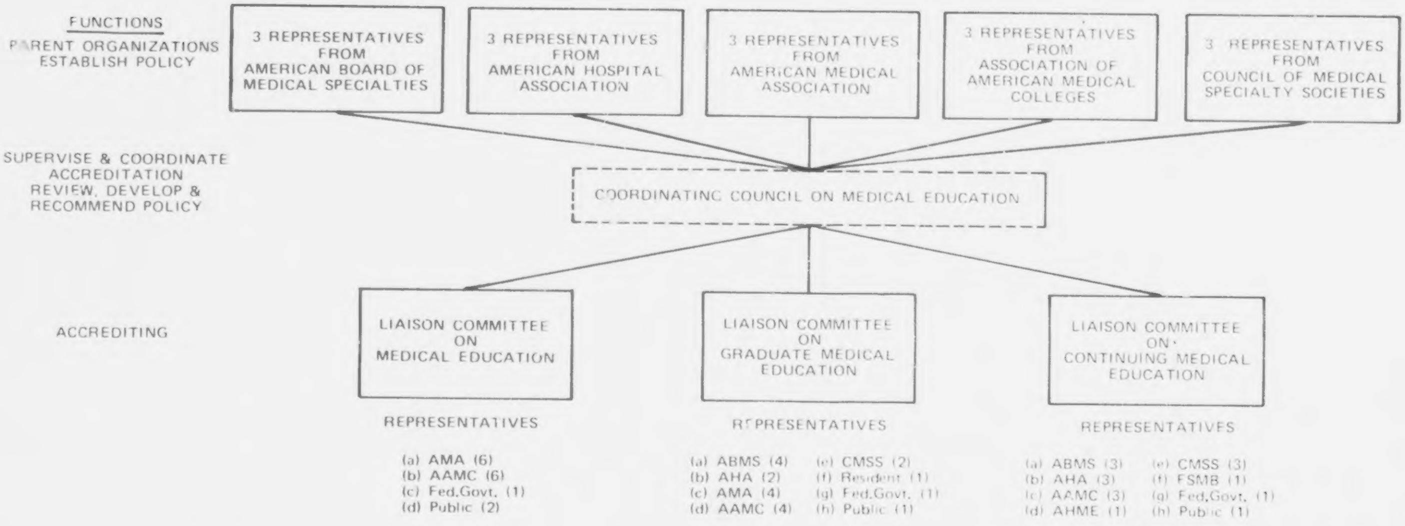
The Accreditation Council for Graduate Medical Education has the authority to accredit graduate medical education programs that have been recommended for accreditation by residency review committees. It establishes policies and procedures for residency program accreditation. Residency review committees may forward their accreditation recommendations to the Accreditation Council for Graduate Medical Education for final action, or a residency review committee may request that the authority to accredit be delegated to it. The Accreditation Council for Graduate Medical Education grants such authority on a time-limited basis, subject to monitoring and periodic review. Program directors are now informed of residency review committee recommendations or accreditation decisions after each residency review committee meeting. This eliminates delays that were caused by waiting until the Liaison Committee on Graduate Medical Education took action, a constant source of irritation and frustration.

The Accreditation Council for Graduate Medical Education is responsible for the General Requirements section of the "Essentials of Accredited Residencies." Changes in the General Requirements must be unanimously approved by the five parents. Residency review committees are responsible for the Special Requirements subject only to review and recommendations by their sponsoring organizations.

Residency review committee sponsors no longer have the authority to approve or disapprove Special Requirements. The Accreditation Council for Graduate Medical Education approves all Special Requirements.

The structure and functions documents establishing the operations of residency review committees are developed by the residency review committees within guidelines established by the Accreditation Council for Graduate Medical Education and are subject to approval by the Accreditation Council for Graduate Medical Education. The Accreditation Council for Graduate Medical Education is responsible for the procedures for appealing adverse accreditation decisions.

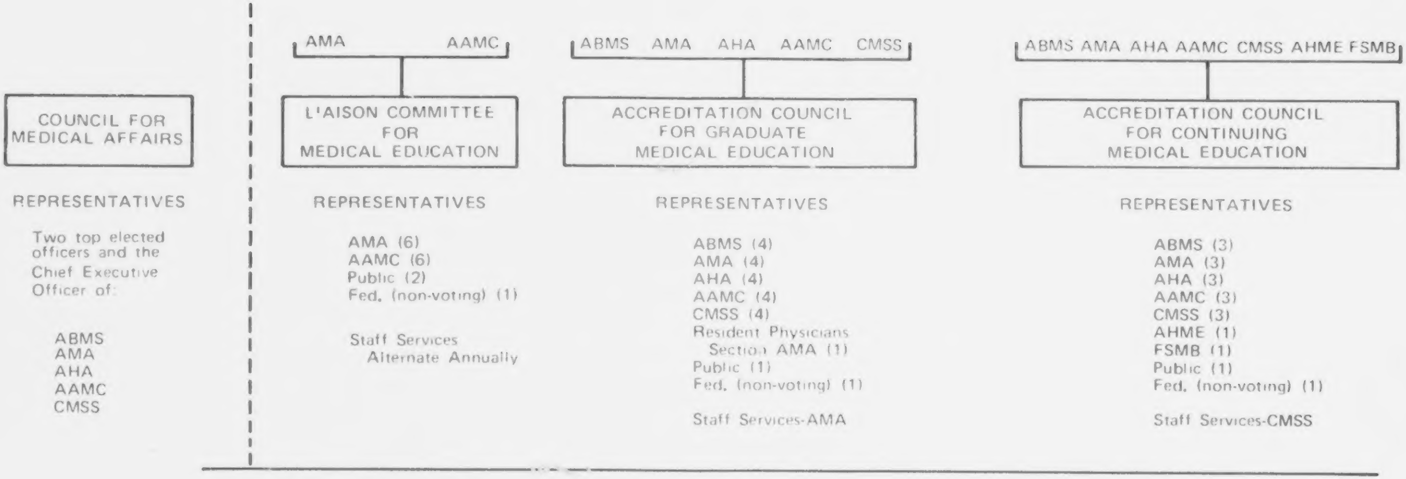
Only specified items require unanimous approval by the parent organizations. The General Requirements of Accredited Residencies and the bylaws must be ratified by all parent organizations. Action within 180 days of receipt is required. A parent organization failing to act within that time is considered to have given approval. Fiscal policies (including fees, service charges, member assessments, grant applications, and the annual budget) and authorizations of new programs and activities must be approved by two-thirds of the members of the Accreditation Council for Graduate Medical Education present and voting. Any parent organization may request within 45 days of the vote the submission of any item so approved to all parent organizations. Each parent organization then must approve the item before it becomes effective. A parent organization must act within 90 days of receipt of such an item or approval is assumed.


FUNCTIONS
PARENT ORGANIZATIONS ESTABLISH POLICY
SUPERVISE & COORDINATE ACCREDITATION REVIEW, DEVELOP & RECOMMEND POLICY
ACCREDITING
3 REPRESENTATIVES FROM AMERICAN BOARD OF MEDICAL SPECIALTIES
3 REPRESENTATIVES FROM AMERICAN HOSPITAL ASSOCIATION
3 REPRESENTATIVES FROM AMERICAN MEDICAL ASSOCIATION
3 REPRESENTATIVES FROM ASSOCIATION OF AMERICAN MEDICAL COLLEGES
3 REPRESENTATIVES FROM COUNCIL OF MEDICAL SPECIALTY SOCIETIES
COORDINATING COUNCIL ON MEDICAL EDUCATION
LIAISON COMMITTEE ON MEDICAL EDUCATION
LIAISON COMMITTEE ON GRADUATE MEDICAL EDUCATION
LIAISON COMMITTEE ON CONTINUING MEDICAL EDUCATION
REPRESENTATIVES
(a) AMA (6)
(b) AAMC (6)
(c) Fed.Govt. (1)
(d) Public (2)
REPRESENTATIVES
(a) ABMS (4)
(b) AHA (2)
(c) AMA (4)
(d) AAMC (4)
(e) CMSS (2)
(f) Resident (1)
(g) Fed.Govt. (1)
(h) Public (1)
REPRESENTATIVES
(a) ABMS (3)
(b) AHA (3)
(c) AAMC (3)
(d) AHME (1)
(e) CMSS (3)
(f) FSMB (1)
(g) Fed.Govt. (1)
(h) Public (1)

AMA	American Medical Association	AHA	American Hospital Association	AHME	Association of Hospital Medical Education
AAMC	Association of American Medical Colleges	CMSS	Council of Medical Specialty Societies	FSMB	Federation of State Medical Boards
ABMS	American Board of Medical Specialties				

SOURCE: American Board of Medical Specialties. *Annual Report, 1978-1979.* Evanston, Illinois: American Board of Medical Specialties, 1979. (Revised 1/1980, Association of American Medical Colleges).

FIGURE 1.1
Accreditation bodies for medical education, 1980.


COUNCIL FOR MEDICAL AFFAIRS
REPRESENTATIVES
Two top elected officers and the Chief Executive Officer of:
ABMS
AMA
AHA
AAMC
CMSS
AMA
AAMC
L'AISON COMMITTEE FOR MEDICAL EDUCATION
REPRESENTATIVES
AMA (6)
AAMC (6)
Public (2)
Fed. (non-voting) (1)
Staff Services Alternate Annually
ABMS
AMA
AHA
AAMC
CMSS
ACCREDITATION COUNCIL FOR GRADUATE MEDICAL EDUCATION
REPRESENTATIVES
ABMS (4)
AMA (4)
AHA (4)
AAMC (4)
CMSS (4)
Resident Physicians Section AMA (1)
Public (1)
Fed. (non-voting) (1)
Staff Services-AMA
ABMS AMA AHA AAMC CMSS AHME FSMB
ACCREDITATION COUNCIL FOR CONTINUING MEDICAL EDUCATION
REPRESENTATIVES
ABMS (3)
AMA (3)
AHA (3)
AAMC (3)
CMSS (3)
AHME (1)
FSMB (1)
Public (1)
Fed. (non-voting) (1)
Staff Services-CMSS

ABMS — American Board of Medical Specialties
AMA — American Medical Association
AHA — American Hospital Association
AAMC — Association of American Medical Colleges

CMSS — Council of Medical Specialty Societies
AHME — Association of Hospital Medical Educators
FSMB — Federation of State Medical Boards

FIGURE 1.2
Accreditation bodies for medical education, 1981.

Appendix 2

Analysis of Internships and Residencies Offered and Filled by U.S. and Foreign Medical School Graduates, 1927–1976

Year	No. of Hospitals	Residencies			Internships		
		Offered	Filled		Offered	Filled	
			USG	FMG		USG	FMG
1927	270	1,699	—	—	4,952	—	—
1930	338	2,028	—	—	5,496	—	—
1935	392	2,563	—	—	6,443	—	—
1940	587	5,118	—	—	6,791	—	—
1945	734	8,930	—	—	8,429	—	—
1950	1,079	19,364	13,145	1,350	9,370	6,308	722
1955	1,201	26,516	17,251	4,174	11,616	7,744	1,859
1960	1,307	32,786	20,265	8,182	12,547	7,362	1,753
1965	1,429	31,898	22,765	9,133	12,954	7,309	2,361
1970	1,517	46,584	26,595	12,968	15,354	8,213	3,339
1972*	1,562	51,658	30,610	14,471	13,650	7,239	3,924
1974*	1,593	57,681	37,310	15,373	10,441	7,071	2,756
1976*	1,702	65,046	45,065	15,496	0	—	—

* From 1971 to 1975 an increasing number of first-year positions were offered and filled as first-year residencies rather than internships; no internships were offered in 1976.

SOURCE: Annual medical education reports published by the American Medical Association.

Appendix 3

Analysis of Residencies by Specialty of Program, 1979

Specialty of Program	October 1979		July 1979
	No. of Accredited Programs	Percent of Total Programs	Residents on Duty
Allergy and immunology	46	1.0	132
Anesthesiology	163	3.5	2,473
Colon and rectal surgery	27	0.6	44
Dermatology	97	2.1	789
Dermatopathology	14	0.3	15
Family practice	366	7.9	6,420
Internal medicine	443	9.6	16,531
Neurological surgery	94	2.0	547
Neurology	120	2.6	1,220
Nuclear medicine	89	1.9	165
Obstetrics/gynecology	306	6.6	4,587
Ophthalmology	163	3.5	1,509
Orthopedic surgery	188	4.1	2,478
Otolaryngology	117	2.5	1,014
Pathology	358	7.7	2,499
Blood banking	18	0.4	21
Forensic pathology	36	0.8	24
Neuropathology	[illegible]	1.2	49
Pediatrics	253	5.5	5,301
Pediatric allergy	25	0.5	64
Pediatric cardiology	51	1.1	125
Physical medicine and rehabilitation	65	1.4	462
Plastic surgery	109	2.3	406
Preventive medicine, general	32	0.7	189
Aerospace medicine	3	0.1	30
Occupational medicine	26	0.6	72
Public health	18	0.4	21
Psychiatry	232	5.0	3,934
Child psychiatry	130	2.8	542
Radiology, diagnostic	220	4.7	2,905
Radiology, diagnostic (nuclear)	30	0.6	54
Radiology, therapeutic	105	2.3	396
Surgery	352	7.6	7,968
Pediatric surgery	17	0.4	24
Thoracic surgery	101	2.2	270
Urology	162	3.5	1,052
Total	4,630	100.0	64,332

SOURCE: *Directory of Residency Training Programs, 1979-80.* Chicago: American Medical Association, 1980.

Appendix 4

Veterans Administration Allocation of Residency Positions by Specialty of Program, 1978-79—1980-81

Specialty of Program	1978-79		1979-80		1980-81	
	No. Positions Allocated	Percent of Total	No. Positions Allocated	Percent of Total	No. Positions Allocated	Percent of Total
Allergy and immunology	13.0	0.2	13.0	0.2	13.0	0.2
Anesthesiology	187.5	2.5	192.5	2.6	211.0	2.7
Colon and rectal surgery	1.0	0.0	1.0	0.0	2.0	0.0
Dermatology	132.2	1.8	128.2	1.7	128.5	1.7
Family practice	74.0	1.0	107.0	1.4	119.5	1.5
Internal medicine	2,476.6	33.3	2,563.5	34.0	2,615.5	34.0
Cardiovascular disease	215.2	2.9	205.5	2.7	204.0	2.7
Endocrinology and metabolism	74.2	1.0	72.2	1.0	71.7	0.9
Gastroenterology	195.5	2.6	176.5	2.3	168.5	2.2
Hematology	119.0	1.6	46.5	0.6	46.5	0.6
Hematology/oncology	0.0	0.0	56.0	0.7	60.0	0.8
Infectious disease	71.5	1.0	70.0	0.9	83.0	1.1
Nephrology	101.1	1.4	106.6	1.4	110.6	1.4
Oncology	0.0	0.0	21.5	0.3	20.5	0.3
Pulmonary disease	146.0	2.0	143.0	1.9	137.5	1.8
Rheumatology	59.5	0.8	58.5	0.8	61.5	0.8
Neurosurgery	86.1	1.2	80.5	1.1	77.5	1.0
Neurology	286.7	3.9	291.5	3.9	304.0	4.0
Nuclear medicine	56.0	0.8	54.0	0.7	57.0	0.7
Ophthalmology	206.5	2.8	203.0	2.7	214.5	2.8
Orthopedic surgery	250.5	3.4	249.5	3.3	259.5	3.4
Otolaryngology	167.0	2.2	165.0	2.2	172.0	2.2
Pathology	305.1	4.1	302.0	4.0	309.0	4.0
Physical medicine and rehabilitation	95.0	1.3	106.5	1.4	113.5	1.5
Plastic surgery	58.5	0.8	56.5	0.8	58.0	0.8
Psychiatry	616.8	8.3	616.5	8.2	596.0	7.8
Radiology, general	0.0	0.0	19.0	0.3	7.0	0.1
Radiology, diagnostic	354.5	4.8	305.5	4.1	332.5	4.3
Radiology, therapeutic	0.0	0.0	24.0	0.3	24.0	0.3
Surgery	835.5	11.2	837.0	11.0	850.5	11.1
Thoracic surgery	52.0	0.7	57.5	0.8	51.0	0.7
Urology	202.5	2.7	201.5	2.7	206.5	2.7
Other	2.0	0.0	0.0	0.0	0.0	0.0
Total	7,441.0	100.3*	7,531.0	100.1*	7,685.8	100.1*

* Figures over 100 percent are due to rounding.

Note: V.A. funding for residencies in fiscal 1979 was $127,579,000; for 1980, $142,722,000, and for 1981, $151,466,000.

SOURCE: Department of Medicine and Surgery, Veterans Administration.

Appendix 5

Distribution of U.S. Medical School Graduates in First-Year Residencies, by Type of Program, 1976–1978

Type of Program	1976		1977		1978	
	No.	Percent	No.	Percent	No.	Percent
Family practice	1,652	12.8	1,721	12.8	1,968	13.8
Internal medicine	4,713	36.1	4,827	36.0	4,997	35.1
Pediatrics	1,290	9.9	1,375	10.3	1,399	9.8
Obstetrics/gynecology	711	5.6	759	5.6	850	6.0
Medical specialties	681	5.4	722	5.4	742	5.3
Dermatology	(11)	(0.1)	(10)	(0.1)	(8)	(0.1)
Neurology	(60)	(0.5)	(64)	(0.5)	(61)	(0.4)
Ophthalmology	(46)	(0.3)	(56)	(0.4)	(56)	(0.4)
Psychiatry	(564)	(4.5)	(592)	(4.4)	(617)	(0.4)
General surgery	1,672	12.7	1,710	12.8	1,814	12.8
Surgical specialties	198	1.5	254	1.9	334	2.4
Neurosurgery	(16)	(0.1)	(21)	(0.2)	(24)	(0.2)
Orthopedics	(127)	(1.0)	(167)	(1.2)	(231)	(1.6)
Otolaryngology	(29)	(0.2)	(27)	(0.2)	(37)	(0.3)
Urology	(26)	(0.2)	(39)	(0.3)	(42)	(0.3)
Support specialties	782	6.1	896	6.7	943	6.6
Anesthesiology	(173)	(1.4)	(211)	(1.6)	(225)	(1.6)
Pathology	(305)	(2.4)	(351)	(2.6)	(317)	(2.2)
Physical medicine	(19)	(0.1)	(30)	(0.2)	(28)	(0.2)
Radiology	(273)	(2.1)	(295)	(2.2)	(349)	(2.5)
Other	(12)	(0.1)	(9)	(0.1)	(14)	(0.1)
Flexible	1,273	9.9	1,141	8.5	1,160	8.2
Subtotal	12,972	100.0	13,405	100.0	14,207	100.0
None	129	—	167	—	182	—
Unknown	460	—	35	—	186	—
Total Graduates	13,561	—	13,607	—	14,575	—

SOURCE: National Resident Matching Program.

Appendix 6

Nationwide Resident Stipends, by Year of Training, 1979–80 and 1978–79

Year of Training	1979–80 Nationwide					1978–79 Nationwide				
	No. of Hospitals	Stipends				No. of Hospitals	Stipends			
		25th Percentile	Median	Mean	75th Percentile		25th Percentile	Median	Mean	75th Percentile
1st Post-M.D. Yr.	319	$13,708	$14,775	$14,811	$15,572	319	$13,000	$13,950	$13,965	$14,750
2nd Post-M.D. Yr.	320	14,700	15,795	15,832	16,640	320	13,822	14,859	14,948	15,725
3rd Post-M.D. Yr.	320	15,500	16,671	16,749	17,450	320	14,573	15,800	15,826	16,567
4th Post-M.D. Yr.	320	16,312	17,518	17,626	18,600	320	15,389	16,651	16,665	17,454
5th Post-M.D. Yr.	313	17,100	18,363	18,495	19,600	313	16,000	17,331	17,488	18,500
6th Post-M.D. Yr.	242	18,000	19,300	19,494	20,800	242	16,904	18,251	18,464	19,779

SOURCE: *COTH Survey of House Staff, Stipends, Benefits, and Funding, 1979.* Washington, D. C.: Association of American Medical Colleges, 1980.

Appendix 7

Average Hospital Expenditures in COTH Member Hospitals for Residents' Stipends and Fringe Benefits, 1978–79

Hospital Category	No. of Hospitals	Expenditures for Residents' Stipends and Fringe Benefits	
		Mean	Median
All responding	338	$2,431,725	$1,672,829
By geographic region			
Northeastern	141	2,301,194	1,691,225
Southern	63	2,372,245	1,642,331
Midwestern	89	2,407,509	1,599,961
Western	45	2,971,886	1,786,835
By affiliation relationship			
University-owned	54	4,071,034	4,008,355
Major affiliate	239	2,249,545	1,562,224
Limited affiliate	37	1,312,891	1,451,796
By hospital ownership			
State-owned	34	3,833,032	3,646,090
Municipally owned	32	4,305,317	3,023,000
Church-owned	33	1,897,880	1,495,596
Other, nonprofit	171	2,245,360	1,555,362
Veterans Administration	68	1,577,105	1,287,658
By bed size			
Less than 385 beds	84	1,598,636	1,112,097
385–512 beds	80	1,858,636	1,235,231
513–695 beds	89	2,323,931	1,880,367
Greater than 695 beds	85	3,907,256	3,154,487

SOURCE: *COTH Survey of House Staff, Stipends, Benefits, and Funding, 1979.* Washington, D.C.: Association of American Medical Colleges, 1980.

Appendix 8

Percentage Distribution of Funding Sources Used To Pay Hospital Costs of Residents' Stipends and Fringe Benefits, Nonfederal Hospitals, 1978–79*

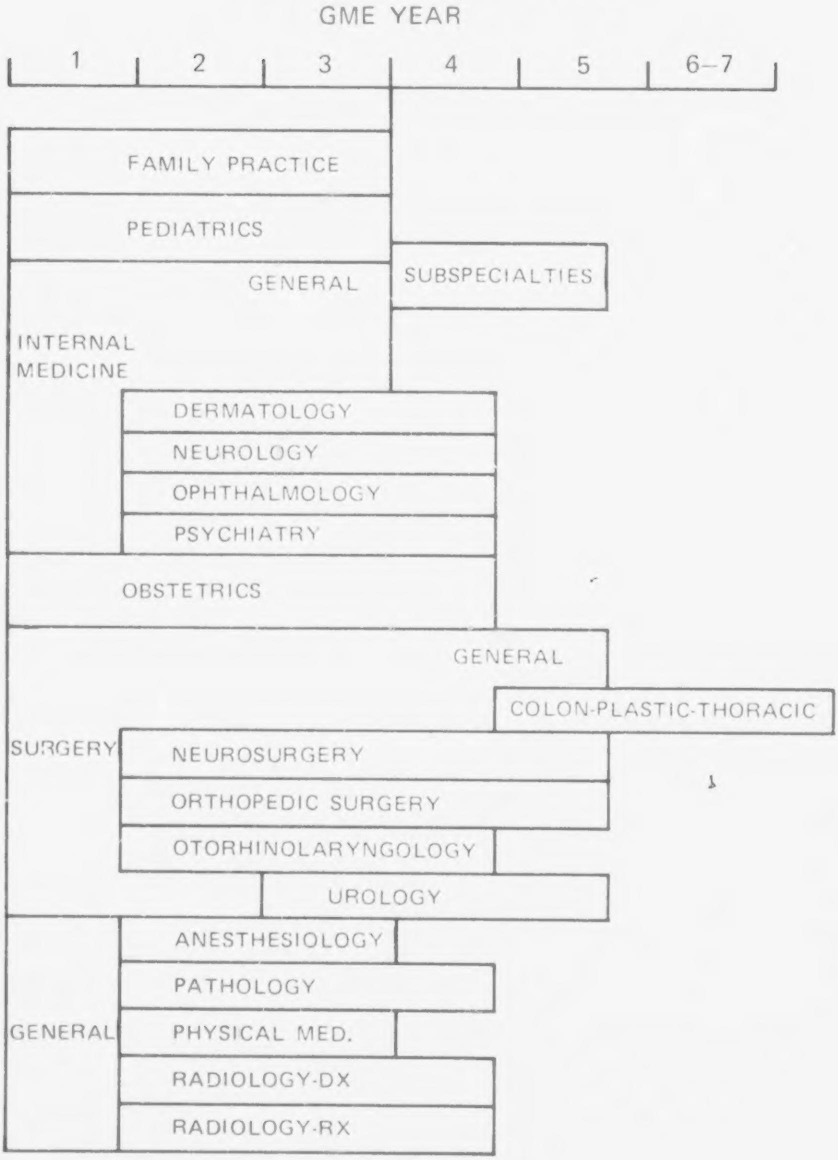
Funding Source	Source of Revenue	
	Residents	Clinical Fellows
Patient revenues and *general* operating appropriations	75.24	52.29
State appropriations *earmarked* for house staff expenses	4.77	1.80
Municipal appropriations *earmarked* for house staff expenses	6.22	0.53
Veterans Administration appropriations	2.00	5.04
Physician fee revenue	1.06	5.62
Medical school/university funds	2.66	4.62
National Institutes of Health	0.47	11.15
Federal agencies other than NIH, VA	1.04	4.11
Endowment income, foundation grants, voluntary agencies	0.15	7.06
Other	6.39	7.78
Total	100.00	100.00

* The number of responding hospitals was 270 with residents and 127 with clinical fellows.

SOURCE: *COTH Survey of House Staff, Stipends, Benefits, and Funding, 1979.* Washington, D. C.: Association of American Medical Colleges, 1980.

Appendix 9

Profile of Progression in Residency Training


GME YEAR
1
2
3
4
5
6–7
FAMILY PRACTICE
PEDIATRICS
GENERAL
SUBSPECIALTIES
INTERNAL MEDICINE
DERMATOLOGY
NEUROLOGY
OPHTHALMOLOGY
PSYCHIATRY
OBSTETRICS
GENERAL
COLON-PLASTIC-THORACIC
SURGERY
NEUROSURGERY
ORTHOPEDIC SURGERY
OTORHINOLARYNGOLOGY
UROLOGY
ANESTHESIOLOGY
PATHOLOGY
GENERAL
PHYSICAL MED.
RADIOLOGY-DX
RADIOLOGY-RX

SOURCE: The National Resident Matching Program.

The educational sequence toward specialty board certification commonly followed by U.S. graduates during residency training is shown. The "general year" shown for the support specialties may be either a flexible program or a year in a broad specialty. Over half of the graduates who enter psychiatry, anesthesiology, and pathology enter their programs directly from medical school.

Appendix 10

General and Special Certifications Offered by American Specialty Boards

Board	General Certifications	Special Certifications
Allergy and Immunology Conjoint Board of the American Boards of Internal Medicine and Pediatrics	Allergy and Immunology	None
Anesthesiology	Anesthesiology	None
Colon and Rectal Surgery	Colon and Rectal Surgery	None
Dermatology	Dermatology	Dermatopathology
Emergency Medicine Conjoint Board of American Boards of Surgery, Internal Medicine, Family Practice, Psychiatry and Neurology, Obstetrics and Gynecology, Pediatrics, and Otolaryngology; American College of Emergency Physicians; University Association for Emergency Medicine; American Medical Association Section on Emergency Medicine	Emergency Medicine	None
Family Practice	Family Practice	None
Internal Medicine	Internal Medicine	Cardiovascular Disease Endocrinology and Metabolism Gastroenterology Hematology Infectious Disease Medical Oncology Nephrology Pulmonary Disease Rheumatology
Neurological Surgery	Neurological Surgery	None
Nuclear Medicine Conjoint Board of the American Boards of Internal Medicine, Pathology, and Radiology; Society of Nuclear Medicine	Nuclear Medicine	Radioisotopic Pathology Nuclear Radiology
Obstetrics and Gynecology	Obstetrics and Gynecology	Gynecological Oncology Maternal and Fetal Medicine Reproductive Endocrinology
Ophthalmology	Ophthalmology	None
Orthopaedic Surgery	Orthopaedic Surgery	None
Otolaryngology	Otolaryngology	None
Pathology	Anatomic and Clinical Pathology Anatomic Pathology Clinical Pathology	Blood Banking Chemical Pathology Dermatopathology Forensic Pathology Hematology Medical Microbiology Neuropathology Radioisotopic Pathology

Appendix 10 (Continued)

Board	General Certifications	Special Certifications
Pediatrics	Pediatrics	Pediatric Cardiology Pediatric Endocrinology Pediatric Hematology-Oncology Pediatric Nephrology Neonatal-Perinatal Medicine
Physical Medicine and Rehabilitation	Physical Medicine and Rehabilitation	None
Plastic Surgery	Plastic Surgery	None
Preventive Medicine	Aerospace Medicine General Preventive Medicine Occupational Medicine Public Health	None
Psychiatry and Neurology	Psychiatry Neurology Neurology with Special Competence in Child Neurology Psychiatry and Neurology	Child Psychiatry
Radiology	Radiology Diagnostic Radiology Therapeutic Radiology	Nuclear Radiology
Surgery	Surgery	Pediatric Surgery
Thoracic Surgery	Thoracic Surgery	None
Urology	Urology	None

SOURCE: American Board of Medical Specialties. *Annual Report, 1978–1979.* Evanston, Illinois: American Board of Medical Specialties, 1979.

Appendix 11

Annual General Certifications by 22 American Specialty Boards, 1964–1978

Board	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1964–1973 Total	1974	1975	1976	1977	1978	1974–1978 Total
Allergy & Immunology												631	286		304		1,221
Anesthesiology	299	290	284	292	311	276	284	327	421	491	3,275	518	608	497	507	453	2,583
Colon & Rectal Surgery	14	12	8	12	13	15	32	23	27	20	176	20	31	29	31	42	153
Dermatology	91	110	94	121	99	114	172	165	151	196	1,313	197	223	271	440	275	1,406
Family Practice							1,690	1,595	1,284	1,240	5,809	1,264	1,709	2,276	3,104	4,952	13,305
Internal Medicine	745	775	657	871	1,013	989	1,191	1,195	4,378	3,298	15,112	3,046	3,324	3,973	4,207	4,566	19,116
Neurological Surgery	56	72	91	72	77	99	82	92	107	101	849	66	82	179	104	99	530
Nuclear Medicine									940	414	1,354	317	397	699	59	52	1,524
Obstetrics/Gynecology	375	416	626	1,255	736	780	625	620	628	706	6,767	734	768	908	829	421	3,660
Ophthalmology	237	267	266	291	290	335	382	383	384	425	3,260	426	502	749	567	517	2,761
Orthopaedic Surgery	253	312	282	364	555	433	418	504	801	541	4,463	657	524	524	719	659	3,083
Otolaryngology	119	81	149	139	157	166	239	332	311	319	2,012	275	282	286	284	303	1,430
Pathology	471	442	431	354	437	431	337	530	554	497	4,484	553	548	607	709	757	3,174
Pediatrics	624	624	675	651	761	793	797	795	762	886	7,368	971	1,195	1,119	1,110	1,157	5,552
Physical Medicine & Rehabilitation	30	45	53	48	53	61	71	63	54	71	549	66	65	68	124	114	437
Plastic Surgery	53	56	48	57	52	53	82	89	92	129	711	144	132	167	157	145	745
Preventive Medicine	93	62	80	99	127	108	124	128	107	105	1,033	115	105	90	103	86	499
Psychiatry and Neurology	348	311	474	364	358	613	742	507	653	554	4,564	720	856	1,399	1,500	1,425	5,900
Radiology	464	403	442	469	463	540	583	724	822	917	5,827	1,389	1,193	983	952	853	5,370
Surgery	753	735	745	721	753	700	777	873	826	799	7,682	806	839	790	954	1,151	4,540
Thoracic Surgery	137	133	173	150	169	130	146	160	200		1,398	158	141	160	146	154	759
Urology	136	139	149	144	179	156	182	206	245	230	1,766	215	437	493	402	385	1,932
Total	3,298	3,285	3,727	6,414	6,603	6,792	8,956	9,311	13,747	11,936	80,072	13,288	14,247	16,267	17,312	18,566	79,680
			29,327					50,745									

SOURCE: American Board of Medical Specialties. *Annual Report, 1978–1979.* Evanston, Illinois: American Board of Medical Specialties, 1979.

Appendix 12

Special Certificates Awarded in 29 Areas, 1974–1978

Area	1974	1975	1976	1977	1978
Dermatology					
Dermatopathology	98	117	48	57	60
Internal Medicine					
Cardiovascular Disease	322	1,052	21	1,015	—
Endocrinology & Metabolism	—	293	—	323	—
Gastroenterology	—	450	—	557	—
Hematology	481	—	345	—	338
Infectious Disease	171	—	181	—	236
Medical Oncology	—	375	—	508	—
Nephrology	389	—	339	—	392
Pulmonary Disease	363	—	368	—	556
Rheumatology	240	—	189	—	263
Obstetrics and Gynecology					
Gynecologic Oncology	66	13	23	28	—
Maternal and Fetal Medicine	16	23	29	37	—
Reproductive Endocrinology	22	15	13	14	—
Pathology					
Blood Banking	49	28	35	28	40
Chemical Pathology	3	3	6	10	8
Dermatopathology	60	27	46	45	51
Forensic Pathology	24	22	36	22	34
Hematology	13	14	45	27	47
Medical Microbiology	1	8	9	13	14
Neuropathology	20	29	20	20	15
Radioisotopic Pathology	149	42	27	22	14
Pediatrics					
Pediatric Cardiology	1	34	—	57	22
Pediatric Endocrinology	—	—	—	—	218
Pediatric Hematology-Oncology	221	—	86	—	134
Pediatric Nephrology	120	—	61	—	—
Neonatal-Perinatal Medicine	—	335	—	236	—
Psychiatry and Neurology					
Child Psychiatry	52	50	76	96	109
Radiology					
Nuclear Medicine	93	21	50	46	89
Surgery					
Pediatric Surgery	—	231	70	24	17

SOURCE: American Board of Medical Specialties. *Annual Report, 1978–1979.* Evanston, Illinois: American Board of Medical Specialties, 1979.

Appendix 13

Accreditation Pre-Site Visit Survey Forms Used by 16 Residency Review Committees

Evaluating programs for accreditation requires that the accrediting bodies have information concerning the factors that determine or influence the quality of the educational program in the institution. The depth and breadth of information requested by the residency review committees in the pre-site visit survey forms, which program directors are required to fill out to supply relevant information about the program being evaluated, can provide insight into the fund of knowledge residency review committees have available when they approve or disapprove a program.

To determine the scope of information now being sought by residency review committees, pre-survey forms used by 16 residency review committees were analyzed by the Association of American Medical Colleges' staff in the spring of 1979. The analysis focused on information provided about the institution, the program and its relationship with other residencies in the institution, and the educational process. Findings were summarized according to institutional information requested, administrative program information requested, and educational information requested.

These tables were developed on the basis of the pre-site visit data collection forms obtained from the Liaison Committee on Graduate Medical Education in 1977. Since these forms were undated, some residency review committees may currently be using evaluation forms that were subsequently revised. Members of the medical education community familiar with evaluation procedures employed by residency review committees may find discrepancies between criteria stated in the Special Requirements for the specialty and the data that are required on the site visit evaluation forms. The discrepancy between the Special Requirements and the pre-site visit evaluation forms suggests that information residency review committees may find relevant in assessing the quality of a graduate program is not always obtained through the present system of surveying residency programs.

Institutional Information

Most residency review committee pre-survey forms asked for information concerning the total number of beds in the institution and the program's specialty service. Six requested data concerning other programs in the hospital.

Although all residency review committees elicit data on available laboratory facilities, some notable omissions were evident. For example, the Residency Review Committee in Internal Medicine did not ask about cardiovascular catheter or pulmonary function laboratories, nor did the Residency Review Committee in Neurology show an interest in the clinical laboratory.

The only residency review committees that sought information about ambulatory services other than those in the specialty being evaluated were family practice and radiology. Family practice was the only residency review committee that requested descriptions of special units such as the intensive care unit and the cardiac care unit. Six residency review committees were interested in information about the emergency room.

Administrative Program Information

All specialties obtained considerable information on the number of teaching staff, residents, and positions filled in their own programs. Nine of the 16 sought information about undergraduate medical students assigned to the service.

The paucity of questions concerning other programs in the institution demonstrates the narrow focus of each residency review committee in evaluating its own programs. Seven of the residency review committees asked for no information about other programs. Four of the survey forms asked whether there were other graduate medical education programs without requesting names of the specialties. On only two survey forms was the accreditation status of related programs noted. Information about the teaching staff of other programs was listed in only one form, and another required that the program director know whether or not medical students were placed on related services. Five residency review committees addressed the area of conjoint activities with at least one other training program in the institution. The identity of the program director for related residency programs in the institution was of interest to fewer than one-third of the residency review committees. Six requested the name of the director of medical education in the institution.

Educational Program Information

Seven of the 16 forms required that the program director list qualifications for residents to be selected, but none asked for a description of procedures used to select residents. A description of educational conferences was required on three out of four forms. The same number wanted an outline or diagram of resident rotations for each level of training. Five residency review committees included items on the content or objectives for each level of training, and eight desired a description of rotations outside the department.

On three forms program directors were asked to list departmental goals for residency training, and four of the residency review committees sought a description of the program's contributions to other residents outside the department.

Evaluation is an integral part of the educational process, but this analysis of the pre-site visit forms suggests that residency review committees in general show little interest in the procedures used to evaluate resident progress or methods of evaluating the program's effectiveness. Four site visit forms asked about resident evaluation procedures, only one required information on evaluating faculty, and two looked into information on internal program evaluation. Seven residency review committees requested that program directors include a description of resident progression of responsibility.

INSTITUTIONAL INFORMATION REQUESTED BY 16 RESIDENCY REVIEW COMMITTEES ON PRE-SITE VISIT ACCREDITATION FORMS

	Residency Review Committee Forms															
Institutional Information Requested	Allergy & Immunology	Anesthesiology	Dermatology	Family Practice	Internal Medicine	Neurology	Obstetrics & Gynecology	Ophthalmology	Otolaryngology	Pathology	Pediatrics	Pediatric Surgery	Plastic Surgery	Psychiatry	Radiology	Sur
Total Number of Beds in Hospital		X	X	X	X	X	X		X	X		X	X	X	X	X
Average Daily Occupancy		X	X	X	X			X				X				
Number of Beds in Hospital for Each Service																
Allergy & Immunology	X															
Anesthesiology																
Dermatology			X													
Family Practice				X												
Internal Medicine	X			X	X					X	X					
Neurology					X	X										
Obstetrics & Gynecology				X			X			X						
Ophthalmology								X								
Otolaryngology									X							
Pathology																
Pediatrics	X			X	X					X	X				X	
Pediatric Surgery																
Plastic Surgery													X			
Psychiatry				X	X	X								X		
Radiology																
Surgery				X						X	X					X

Ambulatory Facilities																
Allergy & Immunology	X															
Anesthesiology																
Dermatology			X													
Family Practice				X												
Internal Medicine					X											
Neurology						X										
Obstetrics & Gynecology				X			X									
Ophthalmology				X												
Otolaryngology																
Pathology																
Pediatrics				X							X				X	
Pediatric Surgery																
Plastic Surgery													X			
Psychiatry				X										X		
Radiology				X												
Surgery				X												X
Laboratory Facilities			X						X	X						
Radiology		X	X	X	X	X	X	X	X		X	X	X		X	X
Clinical	X		X	X	X		X	X			X	X	X	X		
Cardiovascular Catheter																
Electrocardiogram				X							X					
Electroencephalogram						X								X		
Electromyogram						X								X		
Pathology		X	X	X	X	X	X	X	X	X	X	X	X	X		X
Pulmonary Function	X															
Autopsy Rate		X	X	X	X	X	X		X	X	X	X	X		X	X
Emergency Room																
Number of Visits	X			X	X						X		X			X
Special Units																
Intensive Care				X												
Coronary Care				X												
Burn																

ADMINISTRATIVE PROGRAM INFORMATION REQUESTED BY 16 RESIDENCY REVIEW COMMITTEES ON PRE-SITE VISIT ACCREDITATION FORMS

	Residency Review Committee Forms															
Administrative Program Information	Allergy & Immunology	Anesthesiology	Dermatology	Family Practice	Internal Medicine	Neurology	Obstetrics & Gynecology	Ophthalmology	Otolaryngology	Pathology	Pediatrics	Pediatric Surgery	Plastic Surgery	Psychiatry	Radiology	Surgery
Name of Program Director	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full-time/Part-time		X	X		X			X	X		X					
Number of Teaching Staff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full-time/Part-time	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Resident Positions Offered at Each Level	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Resident Positions Filled at Each Level	X		X	X	X	X	X	X	X		X	X	X		X	X
Medical Students Assigned to the Service	X		X		X		X		X			X	X		X	X
Current Accreditation Status	X		X	X	X	X	X	X	X	X	X	X	X	X		X
Date of Last Review (month and year)																
Other Graduate Education Programs in the Institution																
Number				X			X			X				X		
Accreditation Status	X			X												
Names of Program Directors	X			X	X	X								X		
Number of Teaching Staff											X					
Description of Joint Activities			X	X		X	X				X					
Medical Students Assigned to the Service														X		
Name of Director of Medical Education	X		X	X	X						X	X				

EDUCATIONAL PROGRAM INFORMATION REQUESTED BY 16 RESIDENCY REVIEW COMMITTEES ON PRE-SITE VISIT ACCREDITATION FORMS

Educational Program Information	Residency Review Committee Forms															
	Allergy & Immunology	Anesthesiology	Dermatology	Family Practice	Internal Medicine	Neurology	Obstetrics & Gynecology	Ophthalmology	Otolaryngology	Pathology	Pediatrics	Pediatric Surgery	Plastic Surgery	Psychiatry	Radiology	Surgery
Qualifications for Residents to be Selected			X			X		X	X			X		X		X
Description of Selection Procedures																
Description of Educational Conferences	X	X	X	X	X	X	X				X	X	X		X	X
Outline/Diagram of Resident Rotations for Each Level of Training	X		X	X	X	X	X	X	X		X		X		X	X
Description of Content of Rotations for Each Level of Training		X		X		X			X					X		
Identification of Rotations Outside Department	X	X		X		X	X		X				X	X		
Description of Procedures to Evaluate Residents' Skills and Knowledge	X	X		X							X					
Description of Procedures to Evaluate Faculty Teaching				X												
Description of Procedures to Evaluate Training Program	X			X												
Description of the Progression of Resident Responsibility	X		X		X			X	X		X					X
Description of Departmental Goals				X				X			X					
Description of the Program's Contribution to Residents from Outside the Department		X				X							X	X		

Appendix 14

AAMC Invitational Conference on Graduate Medical Education, Washington, D.C., September 29-30, 1980

Roster of Participants*

Abell, M. R., M.D., Ph.D.
Executive director, American Board of Pathology

Adkins, Warren Y., Jr.
Professor and chairman, Department of Otorhinolaryngology, Medical University of South Carolina College of Medicine; representative, Association of Academic Departments of Otolaryngology

Affeldt, John, M.D.
President, Joint Commission on Accreditation of Hospitals

Anderson, Martha K., Ph.D.
Staff associate, Association of American Medical Colleges; and member, project staff, Task Force on Graduate Medical Education, Association of American Medical Colleges

Ankeney, Jay L., M.D.
Professor and acting chairman, Division of Thoracic Surgery, Case Western Reserve University School of Medicine; and president, Society of Thoracic Surgeons

Banks, Henry H., M.D.
Professor and chairman, Department of Orthopedic Surgery, and associate dean for hospital affairs, Tufts University School of Medicine; and executive director, American Board of Orthopedic Surgery

Barnett, B. Lewis, Jr., M.D.
Professor and chairman, Department of Family Practice, University of Virginia School of Medicine; and President, American Board of Family Practice

Bartlett, James W., M.D.
Medical director, Strong Memorial Hospital, Rochester, N.Y.; and representative, American Hospital Association

Bellanti, Joseph A., M.D.
Director, International Center for Interdisciplinary Studies of Immunology, and professor of pediatrics and microbiology, Georgetown University Medical Center; and representative, American Board of Allergy and Immunology

Bennett, William E., Ph.D.
Division of Medicine, Bureau of Health Manpower

Bentley, James, Ph.D.
Associate director, Department of Teaching Hospitals, Association of American Medical Colleges

Bickel, Janet
Staff associate, Division of Student Programs, Association of American Medical Colleges

Black, Ross R., II, M.D.
Assistant director, Division of Education, American Academy of Family Physicians; and observer

Bleich, Maxine E.
Program director, Josiah Macy, Jr. Foundation

Boerner, Robert J.
Director, Division of Student Programs, Association of American Medical Colleges

Bruce, Harry W., Jr., D.D.S.
Executive director, American Association of Dental Schools; and observer

Bryan, Franklin A., M.D.
Director of medical education and associate professor of postgraduate medicine, Indiana-Purdue University of Fort Wayne; and representative, Association for Hospital Medical Education

Burg, Fredric D., M.D.
Associate dean for academic program, University of Pennsylvania Medical Center; and member, Working Group on Quality to the Association of American Medical Colleges Task Force on Graduate Medical Education

Butler, Peter
Senior staff associate, Department of Teaching Hospitals, Association of American Medical Colleges

Castro, Alejandro F., M.D.
Representative, American Board of Colon and Rectal Surgery; representative, Residency Review Committee for Colon and Rectal Surgery; and representative, American Society of Colon and Rectal Surgeons

Clawson, D. Kay, M.D.
Dean, University of Kentucky College of Medicine; member, Task Force on Graduate Medical Education, Association of American Medical Colleges; and chairman, Working Group on Transition to the Task Force

Clemente, Carmine D., Ph.D.
Director, Brain Research Institute, Center for the Health Sciences, University of California, Los Angeles; and chairman, Council of Academic Societies, Association of American Medical Colleges

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* This list includes only those who actually attended the conference and their titles as they were in the fall of 1980.

Cohen, B. Stanley, M.D.
Representative, American Board of Physical Medicine and Rehabilitation

Coleman, Gloria M.
Executive director, Association for Hospital Medical Education; and observer

Collins, F. William, Jr., M.D.
Harvey and Kate Cushing Professor of Neurosurgery, Yale University School of Medicine; and chairman, American Board of Neurological Surgery

Connar, Richard G., M.D.
Member, Liaison Committee on Graduate Medical Education

Cooper, John A. D., M.D., Ph.D.
President, Association of American Medical Colleges

Cruft, George E., M.D.
Associate director, American Board of Surgery

De Lisa, Joel A., M.D.
Representative, Association of Academic Physiatrists

Douglas, Gordon W., M.D.
Professor and chairman, Department of Obstetrics/Gynecology, New York University; member, Task Force on Graduate Medical Education, Association of American Medical Colleges; and chairman, Working Group on National Standards Formulation and Accreditation to the Task Force

Dubach, Ulrich D., M.D.
Professor of internal medicine, Medizinische Universitats-Poliklinik, Kantonsspital Basel, Switzerland

Earley, Laurence E., M.D.
Frank Wister Thomas Professor of Medicine and chairman, Department of Medicine, University of Pennsylvania School of Medicine; and representative, Association of Professors of Medicine

Egan, Richard L., M.D.
Secretary, Council on Medical Education, American Medical Association

Elliott, Ray A., Jr., M.D.
Chairman, Residency Review Committee for Plastic Surgery; and representative, American Board of Plastic Surgery, Inc.

Ellison, Robert G., M.D.
Charbonnier Professor, Department of Surgery, and chief, Department of Surgery (Thoracic), Medical College of Georgia; chairman, American Board of Thoracic Surgery, Inc.; representative, Residency Review Committee for Thoracic Surgery; and representative, Thoracic Surgery Directors Association

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The Physician's Assistant Profession: Results of a 1978 Survey of Graduates

Henry B. Perry, M.D., Ph.D., and Donald W. Fisher, Ph.D.

Abstract—The authors describe the major findings of a 1978 national survey of 4,500 physician's assistants. Seventy-four percent of the respondents were working in primary care specialties, and two-thirds were located primarily in institutions rather than private practice settings. Almost half (47 percent) of the respondents were working in communities of fewer than 50,000 persons. Physician's assistants were more likely than physicians to be working in nonurban areas. The average income of a physician's assistant in 1978 was $17,611, and there was little variation by major specialty or practice-setting categories. Since 1974 there appeared to have been a shift within the profession toward employment in family practice, in institutional settings, and in urban areas. There also had been a notable increase in numbers of women, persons with more extensive educational backgrounds, and persons with civilian allied health backgrounds in the physician's assistant profession.

One of the most significant developments in the practice of medicine in the 1970s was the widespread recognition that appropriately trained non-physicians can, with physician supervision, perform many tasks traditionally carried out by physicians and, in addition, diagnose and treat most problems commonly encountered in primary care settings with no discernible deterioration in the quality of care provided (1–4). Because of a recognized need for additional primary care manpower in many areas of the United States, federal funding incentives during the past decade helped to stimulate the establishment of 198 nurse practitioner programs and 53 physician's assistant programs (5). Currently, there are an estimated 14,700 nurse practitioner program graduates and 10,900 physician's assistant program graduates. At least in the near future, there will continue to be approximately 2,000 nurse practitioners and 1,500 physician's assistants completing training programs annually (6).

Because of the rapid growth of the physician's assistant profession, the changing medical practice environments which graduates are encountering, and the continued national interest in physician's assistants as an important component of health manpower policy formulations, it is desirable to maintain current information for the profession as a whole. Recognizing the need to develop and maintain current information for the physician's assistant

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profession, the Association of Physician Assistant Programs in 1978 conducted a national survey of graduates from its member programs. This report describes some of the major findings of that study.

Method

In 1976 the Association of Physician Assistant Programs (APAP) surveyed the 4,963 graduates of member programs and received responses from 70 percent (3,494). In 1978 these same graduates received a "computer update" questionnaire, and responses were obtained from 73 percent. In addition, the 3,688 physician's assistants who had graduated between 1976 and 1978 also received questionnaires for the first time, and a response rate of 51 percent was obtained. The overall response rate for all graduates surveyed was 63 percent. The responses of these 4,500 graduates form the basis of this report. Approximately one-fifth of the respondents were not working in practice settings because they were involved in research or administrative activities, obtaining further education or training, or had left the profession. Consequently, the number of responses for the table describing the professional activities of the 1978 graduates is considerably less than 4,500.

In order to analyze geographic location more carefully, a 10 percent random sample of civilian physician's assistants was selected. The county location was determined for each of these individuals. A comparison of the major study variables for this 10 percent random sample with those for the entire study population yielded no significant differences. Primary health care manpower shortage area code designations for those counties in which physician's assistants were located were obtained from the Division of Health Professions Analysis, Department of Health and Human Services.

Findings

The average age at graduation from physician's assistant training was 28.5 years. The average age of respondents at the time of the survey was 32.5 years. Women constituted 30.6 percent of the graduates. Forty-five percent of the respondents had graduated from college prior to beginning physician's assistant training. Respondents had worked an average of eight years in a medical field before entering a physician's assistant program.

The most common occupational background was that of military medical corpsman, reported by 42 percent of the respondents. Twenty percent of the respondents had been health technicians or technologists, and 13 percent had been registered nurses. Those with backgrounds in other medical fields (13 percent) and those with no prior medical background (12 percent) made up the remainder of the respondents.

Thirteen percent of the respondents attended a MEDEX program, and 13 percent attended a military sponsored program. One quarter (25 percent) attended a non-MEDEX civilian program based in a medical center without a medical school. Almost half (44 percent) attended a program based in a medical center with a medical school. The remainder (5 percent) qualified to take the certification examination for physician's assistants but did not attend a formal program.

PROFESSIONAL ACTIVITIES

The specialties of physician's assistants are shown in Table 1. Three-quarters of the respondents were working in primary care fields, and two-thirds of those working in primary care were in family practice. Surgical specialties employed 12 percent of the respondents; medical subspecialties, 6 percent; and other specialties, 8 percent.

Approximately one-third of the respondents were working principally in private

TABLE 1

Specialties of 3,416 Physician's Assistants Responding to 1978 Survey

Specialty	Percent
Primary Care	
Family/general practice	52.0
General internal medicine	12.0
Emergency medicine	4.9
General pediatrics	3.4
Obstetrics and gynecology	1.9
Subtotal	74.2
Medical	
Cardiology	2.5
Allergy	1.1
Dermatology	0.7
Endocrinology	0.5
Gastroenterology	0.4
Hematology	0.4
Pulmonary medicine	0.3
Infectious diseases	0.2
Neurology	0.2
Subtotal	6.3
Surgical	
General surgery	5.5
Orthopedic surgery	2.4
Thoracic and cardiovascular surgery	1.6
Urology	1.0
Neurosurgery	0.7
Plastic surgery	0.3
Otolaryngology	0.1
Ophthalmology	0.1
Subtotal	11.7
Other	
Industrial and occupational medicine	2.7
Psychiatry	1.4
Public health and preventive medicine	0.6
Physical rehabilitation medicine	0.4
Radiology	0.3
Anesthesiology	0.2
Other	2.2
Subtotal	7.8

practice settings, almost equally divided between solo (18 percent) and group practice (17 percent). Almost a quarter (24 percent) were working primarily in hospital settings (including both inpatient and/or outpatient settings). Another quarter (23 percent) were working primarily in non-hospital clinic settings. Finally, about one fifth (18 percent) of the respondents were employed by the military. An estimated 30 percent of the respondents worked at least part-time in a government medical facility, and 15 percent worked in a satellite or remote clinic where a physician was not present a majority of the time.

Seventy-four percent of the respondents were involved in in-hospital activities at least part-time, and 59 percent had obtained formal hospital privileges. Among those working at least part-time in a hospital setting, one-third spent most of their time with inpatients. Another quarter spent most of their time in the emergency room, while one-fifth spent most of their time in the outpatient clinic. Ten percent spent most of their time in the operating room, and 7 percent spent most of their time elsewhere in the hospital.

Physician's assistants worked an average of 45.6 hours per week during regular working hours. Thirty-seven of these hours were devoted to direct patient care. In addition, respondents reported that they were on call an average of 37 additional hours per week as well.

GEOGRAPHIC DISTRIBUTION

The regional distribution of physician's assistants and the distribution of the U.S. population were found to be virtually identical. The distribution of physician's assistants by state and their per capita concentration by state were computed. On the basis of the 1978 survey findings, California had the largest number of physician's assistants (362) followed by New York (304). Alaska had the highest per capita concentration of physician's assistants (108 per million population) followed by the District of Columbia, New Mexico, Vermont, and Kansas (each with about 50 physician's assistants per million population). Illinois and New Jersey had the lowest per capita concentration (fewer than three physician's assistants per million population).

Twenty-five percent of the civilian respondents involved in patient care were working in communities of less than 10,000 persons and 22 percent were in communities of 10,000 to 50,000 persons. The geographic distribution by county size was computed for a 10 percent random sample of civilian respondents and compared with the county distribution of U.S. physicians and the general population. These results are described in Table 2.

Physician's assistants were considerably more likely than physicians to be working in nonmetropolitan counties. While physicians were skewed relative to the U.S. population toward urban locations, physician's assistants were slightly skewed toward nonurban areas compared with the general population.

The 1978 classification for the Department of Health, Education, and Welfare was determined for each of the counties in which the physician's assistants in the 10-percent random sample were working. One-third of the sample (32 percent) were working in counties without a primary health manpower shortage. Almost two-thirds (59 percent) were working in counties in which a segment had been declared a shortage area. The remainder (9 percent) were working in counties in which the entire area had been declared to possess a shortage of primary care manpower. Whether the physician's assistants in the second group were actually working in the segment of the county with the primary health care manpower shortage could not be determined from the available data.

INCOME

The average income for physician's assistants in 1978 was $17,611. Differences in income by major specialty categories (that is, the major specialty headings shown in Table 1) were not statistically significant. Differences in income by major practice settings were also not statistically significant. Tests of statistical significance were performed using one-way analysis of variance techniques.

The average incomes in 1978 for physician's assistants with different levels of experience is shown in Table 3. There appears to be an average increment of $1,000 in income associated with each additional year of experience up to four years of experience. Among those with nine or more years of experience as a physician's assistant, the average income continues to increase, although the number of cases is quite small. It should be stressed that these

TABLE 2

Comparison of County Distribution of a 10-Percent Sample of 1978 Civilian Physician's Assistants with the County Distribution of U.S. Non-Federal Physicians and the U. S. Population by Percentages†

County	U.S. Population (n = 214,000,000)	Physician's Assistants (n = 305)	Non-Federal Physicians (n = 370,000)
Nonmetropolitan counties with less than 50,000 inhabitants	16.8	22.0	6.9
Nonmetropolitan counties with over 50,000 inhabitants	10.0	9.5	6.7
Counties in SMSAs with up to one million inhabitants*	31.4	38.0	30.7
Counties in SMSAs with over one million inhabitants*	41.8	30.5	55.7

* SMSA refers to Standard Metropolitan Statistical Area.

† Source of distribution data is Goodman (reference 7).

TABLE 3

1978 Mean Income of Responding Physician's Assistants by Number of Years Since Completion of Training

Years Since Training	No.	Income (In Dollars)
1	947	15,744
2	860	16,800
3	767	17,900
4	534	19,300
5	345	19,400
6	127	20,800
7	29	19,900
8	16	21,400
9 or more	28	24,065

are cross-sectional data and may not be applicable in predicting future career earnings for physician's assistants.

Discussion

In comparing these findings for the physician's assistant profession in 1978 with those previously reported for a profession-wide survey in 1974 (8), several themes become apparent. First of all, there continued to be a strong emphasis upon primary care. Three-quarters of the graduates in 1978, as previously, were working in primary care fields. Within primary care fields, however, there was a notable trend toward family practice and away from general internal medicine. Forty-four percent of the graduates in 1974 compared with 52 percent of the graduates in 1978 were working in family practice. Nineteen percent of the graduates in 1974 were working in general internal medicine compared with 12 percent in 1978.

There appears to be a rather significant trend toward working primarily in institutional rather than in private practice settings. Fifty percent of the graduates in 1974 were working primarily in private practice settings as compared with 35 percent in 1978. In contrast, the percentage of graduates working in institutional settings rose from 50 percent in 1974 to 65 percent in 1978.

Physician's assistants were still more likely to be working in nonurban settings than physicians. Nevertheless, almost three-quarters were working within an SMSA (Standard Metropolitan Statistical Area). There appears to have been an overall modest shift recently toward urban location among physician's assistants. In 1974, 47 percent were working in communities with more than 50,000 persons, while in 1978, 54 percent were located in such areas. Nevertheless, two-thirds of the physician's assistants appear to be located in or adjacent to primary health care manpower shortage areas. A substantial proportion of the physician's assistant profession was still working in smaller communities where physician manpower shortages are greatest.

It is now widely recognized that there has been a major change in the backgrounds of individuals entering the physician's assistant profession. These findings confirm this impression. The proportion of former military medical corpsmen among graduates dropped from 55 percent in 1974 to 42 percent in 1978. Those with no prior medical background became relatively less common (22 percent in 1974, 11 percent in 1978). There was a compensatory increase in representation of individuals with prior backgrounds as medical technologists or technicians, nurses, or employees in other allied health fields. The overall proportion of women doubled from 16 percent in 1974 to 31 percent in 1978. There also was an increase in the educational preparation of individuals prior to entering physician's assistant training. Between 1974 and 1978, the percentage of physician's assistants who had previously completed four years of college rose from 32 percent to 45 percent.

Although the number of physician's assistants in the United States remains quite small relative to the numbers of physicians and nurses, their contribution in enhancing physician productivity, expanding access to primary care, and providing high quality patient care at lower cost is gaining recognition (9, 10). Unfortunately, the forecast of an impending surplus of physicians (11) and anticipated major cutbacks in federal support for physician's assistant training have dampened in some respects the immediate future for the physician's assistant profession. It thus appears likely there may be a reduction in the numbers of physician's assistants being trained.

Nevertheless, it also is likely that there will continue to be a strong demand for employment of physician's assistants within the United States because of their capacity to provide patient care efficiently and effectively. Beyond primary care, there is a growing interest in the role of the physician's assistant in surgery (12), emergency medicine, and other fields. Because of the current overproduction of surgeons and medical subspecialists, there are major potential areas of new utilization for physician's assistants as replacements for junior level residents in these specialties. There are also major opportunities for employment of physician's assistants as junior house officers in institutions heavily dependent upon foreign medical graduates or in community hospitals without residency training programs (13). A continuing expansion of the role of institutional providers, including health maintenance organizations, in providing primary care should also contribute to an ongoing demand for physician's assistants because of the financial savings associated with physician manpower substitution in such settings (10). Finally, even in the face of a possible surplus of physicians, there will continue to be pockets of physician shortages in rural and inner-city areas where non-physicians will be needed to provide primary care.

In the long run, there are potential benefits which might accrue from an eventual reduction in medical school output and an expansion of the production of physician's assistants and other non-physician health practitioners (such as nurse-midwives and nurse practitioners). Health care perhaps could be provided just as effectively at a considerably lower cost, investments in medical training could be less, and services might be more widely distributed.

The development of the physician's assistant profession during the 15 years since its inception has been of great significance for medical practice.The active support of the medical profession has been one important factor contributing to its success to date. The incorporation of the physician's assistant concept on a broader scale still remains feasible, but it will not be practical unless the current levels of training of physicians has been reduced substantially. The potential benefits of widespread utilization of new health practitioners, including physician's assistants, should be given careful consideration by those concerned with long-range health policy. Physician's assistants have proven to be capable and enthusiastic members of the health care team. For this reason, their role in health care should continue to grow.

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DATAGRAM

Sources of Construction Funds in Teaching Hospitals, 1979

Since 1969 the Association of American Medical Colleges has periodically published information on sources of hospital construction funding for the Council of Teaching Hospitals' nonfederal member hospitals. The data were compiled from the American Hospital Association's annual surveys on the sources of funding for hospital construction. Table 1 and Figure 1 present trends in construction funding for COTH nonfederal members from 1969 to 1979. It should be noted that these data are for construction completed in 1969 and for construction begun in 1974 and 1979. Table 2 provides a detailed comparison of the funding sources of (*a*) COTH nonfederal governmental hospitals, which consist of state, county, city, and hospital district facilities; (*b*) COTH voluntary hospitals, which are church-operated and other, nonprofit hospitals; and (*c*) all U.S. nonfederal short-term hospitals, which include the COTH nonfederal member hospitals.

As shown in Table 1, $284 million was spent on capital construction projects in 1969 by 126 responding nonfederal COTH hospitals. At that time, the major source of funding for construction was hospital internal operations ($76 million), followed by state and local government grants and appropriations ($69 million) and borrowing ($58 million).

During 1979, 123 responding COTH members began construction projects expected to total $764 million. When adjusted for inflation, this figure is equivalent to $317 million in 1969 dollars. In 1979, 68 percent of the construction funds came from borrowing or debt financing contrasted to 20 percent in 1969. The second major source of funds in 1979 was hospital internal operations, which generated $131 million. Though this figure appears to be a sharp increase from the $76 million contribution in 1969, it represents only $54 million in 1969 dollars. This financing mechanism actually fell in terms of "real" inflation-adjusted dollars and as a percentage of the total, from 27 percent in 1969 to 17 percent in 1979. Similarly, philanthropy, the third largest contributor of dollars for construction projects in 1979, increased in absolute dollars from $44 million in 1969 to $60 million in 1979. However, when adjusted for inflation, it actually decreased to $25 million in 1969 constant dollars. Philanthropy accounted for 16 percent of total funds in 1969

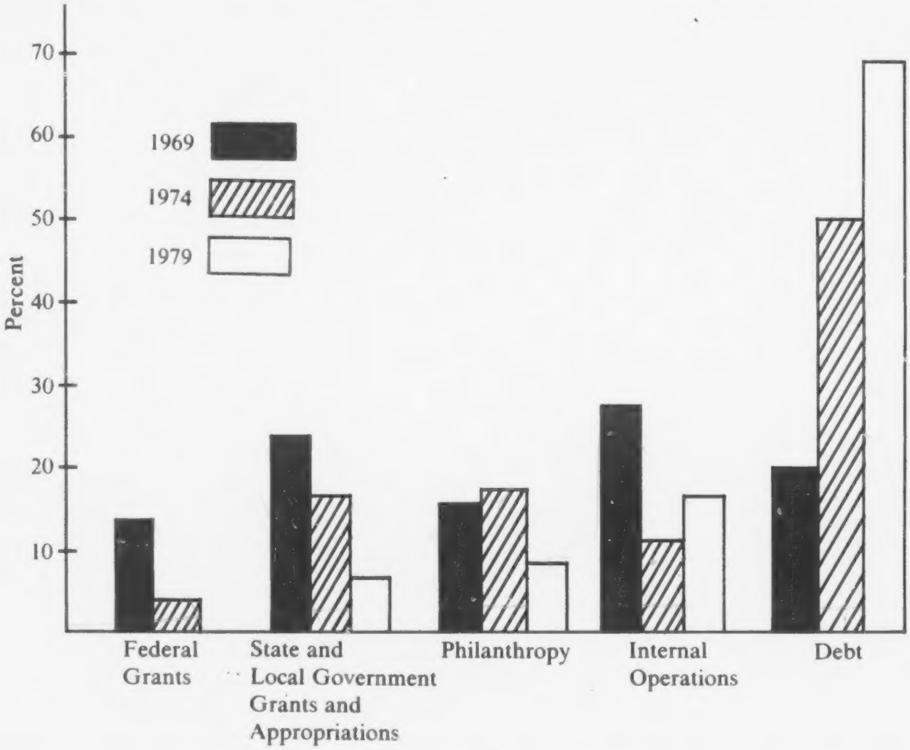
TABLE 1

Funding of Construction Projects in COTH Nonfederal Institutions, 1969, 1974, 1979*

Funding Sources	In Current Dollars (millions)			In Constant (1969) Dollars† (millions)			Percentage of Total		
	1969 (n=126)	1974 (n=83)	1979 (n=123)	1969 (n=126)	1974 (n=83)	1979 (n=123)	1969 (n=126)	1974 (n=83)	1979 (n=123)
Federal grants	$ 37	$ 28	$ <1	$ 37	$ 18	$ <1	13	4	0
State and local grants and appropriations	69	109	51	69	71	21	24	17	7
Philanthropy	44	118	60	44	77	25	16	18	8
Internal operations	76	72	131	76	47	54	27	11	17
Debt	58	328	522	58	214	217	20	50	68
Total	$284	$655	$764	$284	$427	$317	100	100	100

* Source: American Hospital Association's Survey of the Sources of Funding for Hospital Construction, 1969, 1974, and 1979. For 1969, the data reported relate to total funds for construction projects completed in 1969. For 1974 and 1979, the data reflect expected total funds for construction projects begun in those years.

† Source: U.S. Department of Commerce Composite Construction Cost Index. Base period 1972=100; 1969=82.7; 1974=126.9; and 1979=199.6.



SOURCE: American Hospital Association's Survey of the Sources of Funding for Hospital Construction, 1969, 1974, and 1979.

FIGURE 1

Sources of construction funds for COTH nonfederal hospitals, 1969, 1974, 1979.

and 8 percent in 1979. State and local government grants and appropriations also decreased between 1969 and 1979, both in dollar amount and percentage of total construction funds. The 1979 contribution of $51 million (7 percent of total construction funds) is equivalent to $21 million in 1969 constant dollars, a more than three-fold reduction in constant dollars from the $69 million (24 percent of the total construction funds) received from this source in 1969. A marked change during the past 10 years has been the decreasing reliance on federal grants as a financing mechanism. In contrast to federal grants totaling $37 million in 1969, the 1979 contribution fell dramatically to $29,000.

Table 2 presents the sources of construction funds in more detail and by type of hospital. For all hospital groups, state and local tax-exempt bonds were the primary financing mechanisms in 1979. COTH voluntary hospitals were most dependent (59.7 percent) on this source for construction funds; for all nonfederal short-term hospitals and COTH nonfederal governmental hospitals, it provided 49.7 percent and 46.0 percent of the total construction dollars respectively.

Two other sources of construction funds were important to COTH nonfederal government hospitals: state and local government grants and appropriations, representing 22.9 percent of total funding, and earnings gener-

TABLE 2

Percentage of Construction Funds for COTH Nonfederal Hospitals and All Nonfederal Short-Term Hospitals, 1979*

Funding Sources	COTH Nonfederal Governmental Hospitals (n=22)†	COTH Voluntary Hospitals (n=101)†	All U.S. Nonfederal Short-Term Hospitals‡ (n=1006)†
Government			
Federal grants	0.1	0.0	0.3
State and local grants and appropriations	22.9	3.0	3.0
Philanthropy			
Fund raising	0.7	6.2	3.1
Other contributions	0.1	1.8	1.3
Foundation grants	0.0	1.3	1.0
Internal Operations	20.9	16.2	20.3
Debt			
Loans	0.0	1.8	3.9
Taxable bonds	0.0	0.0	2.5
Tax-exempt bonds/state and local	46.0	59.7	49.7
Tax-exempt bonds/IRS	0.0	4.7	6.3
HUD	0.0	0.0	1.3
Hill-Burton	0.0	0.0	0.2
Interest on construction funds	1.4	4.8	3.9
Other	7.9	0.5	3.2

* Source: American Hospital Association's Survey of the Sources of Funding for Hospital Construction, 1979.

† Total funds reported for COTH nonfederal government hospitals—$139,581,406; for COTH voluntary hospitals—$623,565,375; for all U.S. nonfederal short-term hospitals—$3,762,297,500.

‡ Including COTH nonfederal hospitals.

ated by hospital operations, 20.9 percent. COTH voluntary hospitals received very little support from state and local government grants and appropriations (3.0 percent) but did use internal operations' earnings as a significant source of funding (16.2 percent). Finally, taxable bonds, Department of Housing and Urban Development loans, and Hill-Burton monies did not contribute to the sources of funding for construction at any of the responding COTH-member hospitals but provided 4.0 percent of the total funds at all nonfederal short-term hospitals.

In summary, the pattern of financing hospital construction in COTH institutions shifted dramatically during the past decade. The most striking change was in the use of debt financing, which grew from 20 percent of the total construction funds in 1969 to 68 percent in 1979, making contributions from other financing sources relatively less significant. When adjusted for inflation, total construction funds did not increase substantially in "real" dollars from 1969 to 1979.

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Medical Student Research: A Program of Self-Education
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Case Mix Complexity Differences Between Teaching and Nonteaching Hospitals

Richard P. Ament, Edward J. Kobrinski, and Walter R. Wood

Abstract—In the study reported here, the authors measured the differences between teaching and nonteaching hospitals in case mix complexity and provided some detail concerning the differences. They measured case complexity in a sample of 200 short-term general hospitals by the Resource Need Index (RNI) using a cross-classification of 3,490 case types with weights compiled from patient charges. Median RNI values were moderately higher for teaching than for nonteaching hospitals both for the hospital as a whole and for each clinical service except obstetrics-gynecology. The most resource-intensive case types were relatively more frequent in the teaching hospitals, but the least resource-intensive types were of about equal relative frequency in the two hospital groups. The results show that teaching hospitals could be expected to cost somewhat more per patient even if case mix were the only factor.

Several studies have concluded that patient mix is an important determinant of hospital costs. In a limited number of studies, diagnostic case mix variables have been explicitly introduced to explain variation in hospital costs (1–4).

But the literature provides little information on the case mix component of cost differentials between teaching and nonteaching hospitals. An early study of Lave and Lave related teaching status to various case mix indices (5), but the results could not be used quantitatively in explaining or justifying cost differences between teaching and nonteaching hospitals, because the weights used in their calculation only indirectly related to the costliness of the different case types. Two studies measured the contribution of case mix to the excess of average length of stay in teaching hospitals over that in nonteaching hospitals, but neither analyzed total costs nor accounted for the substantial expenses due to ancillary services. In the first study, hospitals with interns or residents had expected average stays that were in excess of those in nonteaching hospitals by 0.5 day for hospitals with 5,000 to 9,999 annual discharges, by 0.5 day for hospitals with 10,000 to 14,999 discharges, and by 0.2 day for hospitals with 15,000 or more discharges (6). In the second study, major teaching hospitals had longer expected average stays than other teaching hospitals by 0.4 day (7).

Two other studies used case mix measures reflecting total charges of patients in base data. A 1976 study of 76 hospitals participating in the "Study of Patient

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Charges" (SPC) of the Commission on Professional and Hospital Activities (CPHA), a medical records abstracting service, found statistically significant higher median case mix index values in hospitals with residents than in other hospitals (8). The Office of Research, Demonstrations, and Statistics of the U.S. Health Care Financing Administration used a 20 percent sample of the Medicare patient records for 1978 from some 5,600 hospitals to calculate for each hospital's Medicare patients an overall case mix measure. The researchers applied case-type weights representing national averages of Medicare patient bills adjusted for cross-subsidization, level of teaching activities, and local wage rates. Hospitals having a ratio of residents and interns to beds exceeding 0.25 had significantly higher values of the case mix measure than other hospitals.

One reason for the dearth of studies on case mix differences between teaching and nonteaching hospitals is that financial information on individual hospitalizations has seldom been merged with the medical record information needed to class patients into case types. The linkage of financial and medical information is made, however, in SPC data at the CPHA. The present study made use of this data base in obtaining weights, derived from patient charges, to represent the case complexity of the various case types. For each hospital, these weights were applied to the proportions of patients falling into the various case types to yield an index of case mix, the Resource Need Index (RNI) (2). The RNI was used in this study to test the hypotheses.

As previously stated, teaching hospitals, especially major teaching hospitals, presumably attract a mix of patients that intrinsically is relatively costly to treat. Therefore, it was hypothesized that the highest RNI values would be found in the major teaching hospitals, the next highest in the other teaching hospitals, and the smallest in the nonteaching hospitals. Since hospital size also has been thought to affect case mix, this hypothesis was examined separately for each of several size groups. To provide some detail in the expected findings, the analyses of hospital-wide RNI values were repeated by clinical service.

Because teaching hospitals are often considered referral hospitals that attract the hardest-to-treat patients, an additional hypothesis was that individual patients represented by very high case mix weights would be relatively more frequent in teaching hospitals than in nonteaching. A further hypothesis was that the patients with very low RNI values would be found with equal relative frequency in both sets of hospitals. Both of the foregoing hypotheses could be accepted if patients with RNI values in the middle range are admitted less frequently to the teaching hospitals. Again, detail was added by repeating these analyses in individual clinical services.

Methods

The resource needs of the hospitals were estimated by the RNI, which is a case mix complexity index displayed in the routine reports of the SPC (8) of the CPHA and which also is featured in ad hoc reports prepared for other hospitals that supply hospital discharge abstracts in which diagnoses and operations are coded in *H-ICDA*, *ICDA-8*, or *ICD-9-CM*. To define case types for this index, a cross-classification was used. Patients were first divided on the basis of principal diagnosis into the 349 groupings of the original CPHA List A: Hospital Diagnosis Groups (9). Each of the diagnosis groups was divided into two subgroups according to presence or absence of surgery, and each of these was split into five age ranges (or five birth weight groups for newborn patients).

Thus, 3,490 case types resulted. This classification is identical to that used in the series of books on length of stay statistics published by the CPHA, except that the CPHA books make a further split on presence or absence of secondary diagnoses.

The base for the RNI consists of charge norms (expected charges) for the 3,490 case types in the classification. The present study used the 1971–74 version of the base, compiled from 1.8 million patients from a changing cohort of approximately 50 hospitals that participated in the SPC during those years. These are self-selected nonfederal short-term general hospitals in the United States, representing a wide variation in size and location and including both teaching and nonteaching hospitals (8). Before the calculation of the charge weights, the actual charges were adjusted for local economic conditions and inflation.

The meaning of the RNI and its construction are explained as follows. One measure of a hospital's case mix complexity is the average total charge per patient that would have resulted if each patient's charge had been typical for that kind of patient, that is, had been equal to the norm or weight compiled for that kind of patient in base data. This measure may be called the average norm of total charge or the expected average charge and is computed by the formula

$$\sum_j P_{jk} W_j,$$

where P_{jk} is the proportion of patients in type j among all the patients in hospital k, and W_j is the norm of total charge for case type j in base data.

The RNI is simply the ratio of this quantity for hospital k to the corresponding quantity for the base data, that is, to the per-patient average norm of total charge in the base. For hospital k, then,

$$\mathrm{RNI}_k = \sum_j P_{jk} W_j \Big/ \sum_j P_{j+} W_j,$$

where P_{j+} is the proportion of cases in case type j among all the patients in the base.

Thus, if hospital k has a mix of patients like that in the base, its RNI would be 1.00; if its mix is richer than usual in the kinds of patients that ordinarily incur high total charges, its RNI would be greater than 1.00. Since the RNI values calculated for this study excluded births, they tended to average a little higher than 1.00.

For this study, hospitals were drawn from a sampling frame consisting of all short-term nonfederal not-for-profit general hospitals that were enrolled in the CPHA's Professional Activity Study (PAS) for the entire year 1976 and that discharged enough births to account for at least 1 percent of their total patient volume. These hospitals were cross-classified by census region, hospital size, and teaching status. Total annual discharges were used as follows to define four hospital size groups: (*a*) medium-small hospitals: 5,000 to 9,999 annual discharges; (*b*) medium hospitals: 10,000 to 14,999 annual discharges; (*c*) medium-large hospitals: 15,000 to 19,999 annual discharges; and (*d*) large hospitals: 20,000 or more annual discharges.

For purposes of this study, three categories of hospital teaching status were used—major teaching, other teaching, and nonteaching. Major teaching hospitals had approved residencies (10) in at least three of the four specialties, internal medicine, obstetrics-gynecology, pediatrics, and surgery, or in at least two of them if the hospital did not serve patients in all four areas. The remaining hospitals were called other teaching hospitals if they had accredited residencies in at least one of the four specialties and nonteaching hospitals if they had no residencies in any of these specialties.

Within each combination of teaching status and size group, geographic balance was obtained by drawing the same number of hospitals from the sampling frame for each region; the constant number drawn was the largest permitted by the sampling frame up to a maximum of 10.

A total of 200 U.S. hospitals enrolled in the PAS were selected in this way. For each hospital, the RNIs were calculated for the total hospital excluding newborn patients and, in addition, for five broad clinical services that together accounted for all patients. For comparability among hospitals, each patient's service was assigned by computer, using the computer program module whose routine use was to supply service categories to all patients in the PAS system for whom the hospital omitted this item from the case abstract.

For the hospital as a whole excluding newborn and for each service separately, RNI values were compared between hospital groups as follows: (*a*) teaching hospitals (major teaching and other teaching taken together) versus nonteaching hospitals, within size categories, and (*b*) major teaching hospitals versus other teaching hospitals, within size categories.

For hospitals that had at least 10 patients in the given category, median differences between RNIs were calculated using the Hodges-Lehmann estimator (11), and the statistical significance of these differences was tested by the Wilcoxon rank-sum test (11). These nonparametric techniques were chosen to maximize stability in the estimates and to minimize error in the statistical tests due to outliers.

The comparisons of RNIs were complemented by corresponding comparisons of distributions of patients according to their individual RNI values to determine whether case types that ordinarily incur high hospital bills tended to be concentrated in teaching hospitals.

Results

In all four size groups, teaching hospitals had slightly higher Resource Need Index values than nonteaching (Table 1); in two size groups the difference was statistically significant ($p < .05$) and in one nearly significant ($p = .052$). The difference was most pronounced among the largest hospitals and least pronounced among the smallest hospitals. But even in the largest size group, the median difference was under 10 percent.

Major teaching hospitals differed little

TABLE 1

Comparison of Hospital-Wide Resource Need Index (RNI) Values Between Teaching and Nonteaching Hospitals Participating in Professional Activity Study (PAS), 1976

Hospitals	No.	No. of Patients	Median RNI	Median Difference*	Significance Level (p value)†
Medium-Small					
Teaching	16	110,839	1.070	.029	.304
Nonteaching	40	254,574	1.029		
Medium					
Teaching	20	225,559	1.133	.056‡	.020
Nonteaching	40	452,785	1.079		
Medium-Large					
Teaching	40	643,185	1.132	.048	.052
Nonteaching	20	312,312	1.077		
Large					
Teaching	16	377,312	1.166	.093‡	.038
Nonteaching	8	169,160	1.067		

* Teaching minus nonteaching, calculated using the Hodges-Lehmann estimator.

† Determined by means of the Wilcoxon rank-sum test (two tails).

‡ Significant at the .05 level.

from other teaching hospitals with respect to RNI values (Table 2). In fact, major teaching hospitals actually had the smaller median RNIs in the two smallest size groups, although none of the differences were statistically significant. Major teaching hospitals showed a persistent increase in RNI from one size group to the next. The corresponding increase in RNI among the other teaching hospitals was neither as uniform nor as great.

There was a great overlap in the RNI distributions from one hospital group to another, as seen in Figure 1. For example, in the 800 possible pairs consisting of one teaching and one nonteaching hospital from the 40 teaching and 20 nonteaching hospitals in the medium-large size group, the teaching hospitals had a higher RNI value in only 68 percent of the pairs. There was an even greater degree of overlap between the two levels of teaching activity.

The broad clinical services of pediatric medicine, general medicine, general surgery, and newborn were represented by teaching-nonteaching differences in RNI values (Table 3) that crudely paralleled those found for the whole hospital's patients excluding births (Table 1) in that the differences were all positive and, except for newborn, were greater in the largest-size hospitals than in the smallest. Obstetrics-gynecology presented a different picture, however, with little teaching-nonteaching difference in RNI values at any size level.

Case types that require little resources were found in about the same proportions in all the hospital categories, as seen in the lower percentile lines in Figure 2. On the other hand, costly-to-treat case types were relatively much more abundant in teaching than in nonteaching hospitals. In fact, patients with individual RNI values over 2.00 were about a third again as abundant in the teaching as in the nonteaching hospitals. The exception to this rule is the medium-small hospitals, where the major teaching hospitals had slightly fewer of the high-resource patients than even the nonteaching hospitals. Within clinical services, the excess proportion of high RNI values for individual patients in teaching hospitals over those in nonteaching hospitals was most pronounced in the newborn service and in pediatric medicine, followed

TABLE 2

Comparison of Hospital-Wide Resource Need Index (RNI) Values Between Major Teaching and Other Teaching Hospitals Participating in PAS, 1976

Hospitals	No.	No. of Patients	Median RNI	Median Difference*	Significance Level (*p* value)†
Medium-Small					
Major	4	30,075	.943	−.130	.132
Other	12	80,764	1.076		
Medium					
Major	16	182,697	1.122	−.030	.616
Other	4	42,862	1.154		
Medium-Large					
Major	20	321,780	1.144	.010	.646
Other	20	321,405	1.104		
Large					
Major	8	199,217	1.198	.032	.506
Other	8	178,095	1.149		

* Major teaching minus other teaching, calculated using the Hodges-Lehmann estimator.

† Determined by means of the Wilcoxon rank-sum test (two tails).

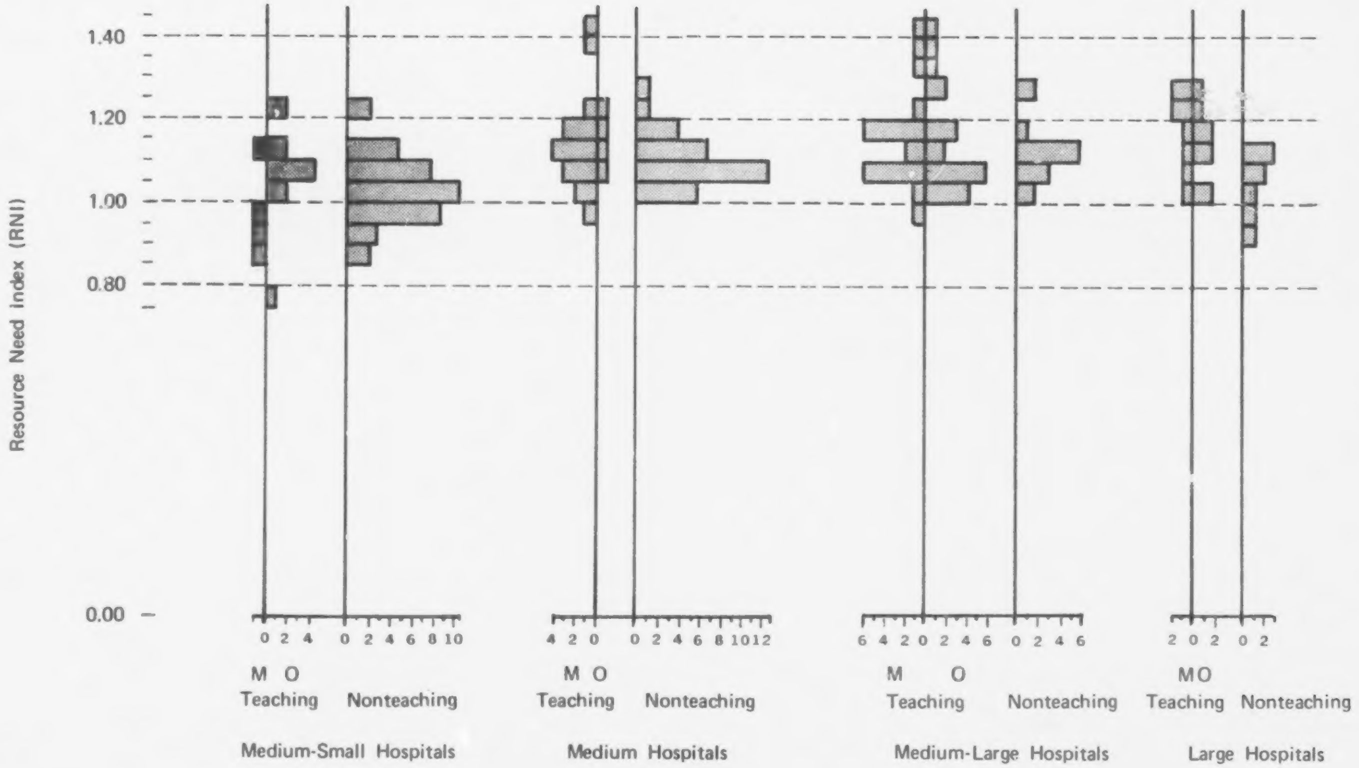

FIGURE 1

Distributions of hospital RNI values, by hospital size by teaching status (M = major teaching hospitals; O = other teaching hospitals).

TABLE 3

Comparison of Resource Need Index (RNI) Values Between Teaching and Nonteaching Hospitals by Clinical Service

Service/Hospital Size	Teaching Hospitals			Nonteaching Hospitals			Median Difference*	Significance Level (*p* value)†
	Median RNI	No.	Patients	Median RNI	No.	Patients		
Pediatric Medicine								
Medium-small	.644	3	1,000	.608	51	13,000	.066	.069
Medium	.630	9	7,000	.615	51	21,000	.027	.342
Medium-large	.669	14	13,000	.640	46	22,000	.024	.522
Large	.855	8	11,000	.652	16	11,000	.176‡	.004
General Medicine								
Medium-small	1.192	9	21,000	1.225	47	96,000	.001	.976
Medium	1.319	17	62,000	1.248	43	150,000	.068§	.020
Medium-large	1.348	28	136,000	1.273	32	148,000	.069‡	.006
Large	1.354	10	76,000	1.329	14	85,000	.043	.522
General Surgery								
Medium-small	1.136	13	37,000	1.121	43	117,000	.023	.528
Medium	1.279	18	88,000	1.172	42	219,000	.116‡	.002
Medium-large	1.279	34	253,000	1.180	26	185,000	.086‡	.006
Large	1.238	11	118,000	1.211	13	132,000	.056	.258
Obstetrics-Gynecology								
Medium-small	.657	5	13,000	.647	51	66,000	− .002§	.944
Medium	.638	15	38,000	.661	45	93,000	− .013‡	.418
Medium-large	.651	22	76,000	.668	38	121,000	− .011§	.318
Large	.685	14	70,000	.657	10	44,000	.005‡	.818
Newborn								
Medium-small	.247	3	2,000	.221	53	35,000	.042	.048
Medium	.258	9	12,000	.227	51	53,000	.031	.006
Medium-large	.241	14	24,000	.227	46	73,000	.013	.036
Large	.260	8	19,000	.225	16	41,000	.039	.001

* Teaching minus nonteaching, calculated using the Hodges-Lehmann estimator.

† Determined by means of the Wilcoxon rank-sum test (two tails).

‡ Significant at the .01 level.

§ Significant at the .05 level.

by general medicine and general surgery (data not shown). In obstetrics-gynecology, there was a slight contrast in the other direction. In all services, patients with the lowest RNI values had about the same relative frequency in teaching as in nonteaching hospitals.

Discussion

The RNI is a case mix index that expresses the average of case complexity weights that have been assigned to the patients according to their case types. Each weight, compiled from base data, represents the mean amount of resources used as reflected by patient total charges. A hospital that has a high average for the weights of its patients, that is, a high RNI value, may be said to have a complex case mix in the economic sense.

Two potential problems of a case mix measure built on total charges are (*a*) that charges do not perfectly reflect costs and (*b*) that for some applications a case mix measure should relate to direct costs instead of total costs. Evidence that these problems are not serious is found in a study of 316 short-term hospitals in the United States (12); the RNI correlated extremely high ($r = .97$) with a similar case

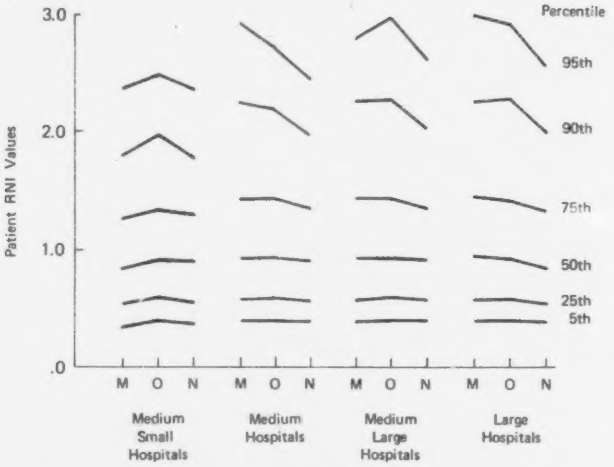

FIGURE 2
Percentile distributions of individual patients' RNI values, by hospital size by teaching status (M = major teaching hospitals; O = other teaching hospitals; N = nonteaching hospitals).

mix measure that used diagnosis related groups with New Jersey direct cost weights. The small difference between that correlation and perfect correlation (r = 1.00) is partly due to the double distinction between total charge and direct cost, but it also reflects differences between the data bases used for calculating the weights, between rules for excluding outlier patients, and between case-type classifications.

A third potential problem is that teaching-nonteaching differences in case mix index values could be partly due to the corresponding pricing and intensity differences and not simply to differences in the intrinsic costliness of the patients. For example, suppose that there were only two case types and that the average charge was $1,000 for each in nonteaching hospitals and $1,200 for each in teaching hospitals but that case type Y is relatively twice as frequent in teaching hospitals. Then the weight for case type Y would exceed that for case type X, and so the teaching hospitals would have a higher case mix index than the nonteaching hospitals. To avoid such spurious effects, individual patients' total charges were adjusted before being averaged across hospitals within case types to produce the weights for the RNI. The adjustment divisor for each half year's data for each hospital contributing to the weights was proportional to the ratio of the actual average charge to the RNI value calculated from weights compiled from earlier years' data. Since this adjustment was carried out each time new charge weights were compiled, the third generation weights used in this study would be almost completely free of the kind of distortion described above.

In any case, there appears to be no reason to suspect that comparisons among hospitals would be biased by the characteristics of the RNI statistic.

That the teaching-nonteaching differential in case mix complexity increased with hospital size is consistent with the concept of large teaching hospitals as being referral centers for patients whose care is difficult and costly. As might be expected, the same interaction was observed within the teaching hospitals between size and teaching status in accounting for variations in RNI values; but the reverse direction of the difference in the two smaller-size groups seems surprising and needs further investigation.

The previously mentioned contrasts in hospital-wide RNI values between teaching and nonteaching hospitals were paralleled by similar contrasts within four of the five clinical services. The exception was that the teaching-nonteaching differences were not found in the obstetrics-gynecology service. An interpretation may be that only a small proportion of delivery cases are identified beforehand as being so difficult to manage as to influence the choice of hospitals.

The substantial teaching-nonteaching difference in proportions of patients with very high case mix weights contrasted with the lack of a corresponding difference for very low case mix weights. In any case, the distributions of case mix weights were not grossly dissimilar between the two groups in any of the clinical services. Evidently, routine case types requiring little resources are as well represented in teaching hospitals as in nonteaching hospitals. One would also surmise that the kinds of patients seen by medical students and residents closely resemble those they can expect to find in nonteaching hospital environments.

The economic impact of case mix complexity differences found in this study may be gauged by translating them into dollars. In 1981, for example, case mix alone should account for about $100 of the difference in average cost per case between teaching and nonteaching hospitals in the medium and medium-large size groups and $180 in the large size group. These figures were obtained by assuming that the respective RNI differences of about .05 and .09, found in this study, would hold true for 1981, for which a conservative estimate of average cost per case is $2,000. The latter figure is the approximate result of applying an annual growth factor of 11 percent to the $1,641 average adjusted expense per admission in community hospitals in 1979, as reported in *Hospital Statistics* (13). Thus, the extra expense burden of a medium-sized teaching hospital due to its more complex case mix is likely to exceed $1,000,000 a year. It is important, therefore, that reimbursement differentials for teaching hospitals make sufficient allowance for their heavier case mix.

Conclusion

Analysis using the RNI as a measure of case mix complexity revealed that the case mix in teaching hospitals on the average is intrinsically somewhat more resource intensive than the case mix in nonteaching hospitals, irrespective of the costs of the teaching or research functions or differences in the intensity of care provided to given kinds of patients. It follows that fair reimbursement of teaching hospitals should adequately compensate for their greater case mix complexity.

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DATAGRAM

Inflation and Medical School Faculty Salaries

Inflation has been a troubling phenomenon for the last several years for the medical schools and their faculties, as well as for other segments of the economy and other employed persons. This datagram compares a five-year span of faculty compensation data with the corresponding consumer price index in order to determine how medical school faculties have fared in keeping pace with inflation. (The data are based on the annual studies, *Report on Medical School Faculty Salaries*, of the Association of American Medical Colleges and on U.S. Bureau of Labor Statistics reports.)

Mean compensation data for basic and clinical science faculties are presented in Figure 1. During the period from September 1976 to September 1980, mean compensation for basic and clinical science faculties increased 32 and 36 percent respectively. After adjusting for inflation, however, mean compensation in constant dollars for basic science faculties declined by more than 9 percent. Clinical science faculties for the corresponding time span suffered a real loss in purchasing power of more than 6 percent. By way of comparison, the average weekly earnings, adjusted for inflation, of private nonagricultural workers declined by 7 percent over the same time period.

In 1976 the mean basic science compensation was equivalent to 65.4 percent of the average

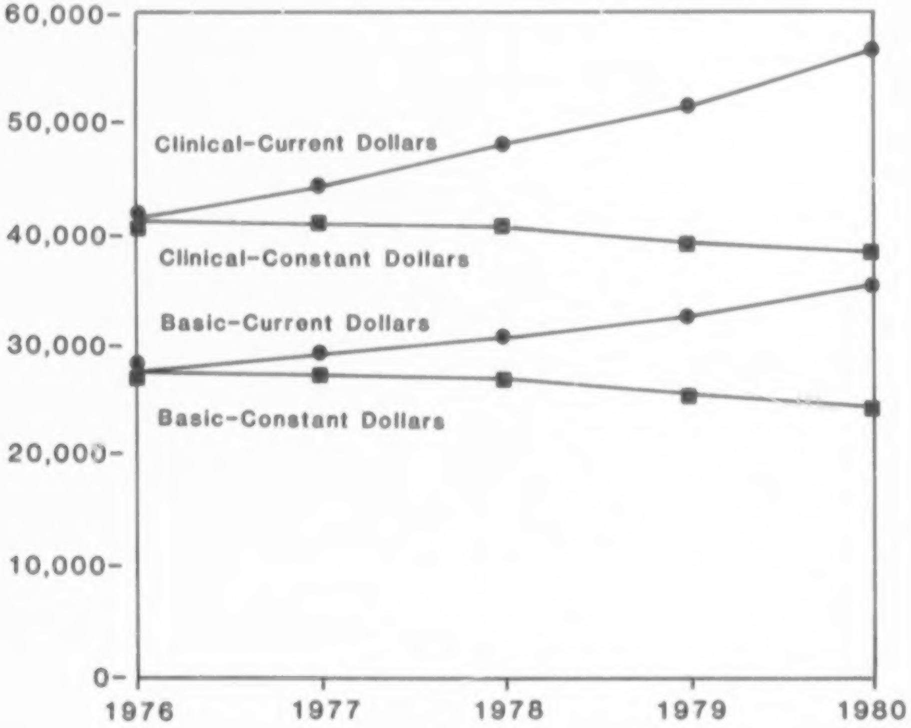

FIGURE 1
Mean salary for basic and clinical faculty in current and constant dollars.

TABLE 1

Comparison of Medical School Faculty Compensation, 1976-77—1980-81

	Basic Science Faculty			Clinical Science Faculty		
Year	Current Mean Salary	Equivalent Necessary To Maintain 1976 Purchasing Power	Cumulative Decrease in Real Purchasing Power	Current Mean Salary	Equivalent Necessary To Maintain 1976 Purchasing Power	Cumulative Decrease in Real Purchasing Power
September 1976	$27,300	$27,300	—	$41,700	$41,700	—
September 1977	28,900	29,200	1.0%	44,400	44,500	0.2%
September 1978	30,900	31,500	1.9	47,900	48,100	0.4
September 1979	33,100	35,300	6.2	51,600	54,000	4.4
September 1980	36,000	39,800	9.5	56,800	60,800	6.6

clinical science compensation; by 1980 this proportion had declined to 63.3 percent.

In order to purchase in 1980 goods and services identical to those purchased in 1976, basic science faculties would have had to earn a mean compensation of $39,800 in 1980 and the clinical faculty a mean compensation of $60,800 (Table 1). The actual mean compensations were $36,000 and $56,800, respectively.

These data reflect the relative worth of faculty positions over time and do not measure changes in income for the individual faculty member. A new assistant professor hired in 1980 had less purchasing power than an assistant professor hired in 1976. However, since individuals may have been promoted or received merit increases relative to the mean for their rank, these data do not show conclusively that individual faculty members lost purchasing power.

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Supplement

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A Study of Geriatric Training Programs In the United States

Alan S. Robbins, M.D., Susan Vivell, Ph.D., and John C. Beck, M.D.

Abstract—Training physicians in geriatrics is essential to improving health care for the elderly. The study reported here provides a detailed analysis of geriatric education at the undergraduate, graduate, and fellowship levels. The number of programs for medical students and residents has increased but is still relatively few; most are elective, and they are of variable quality. Both the number of fellowship programs (36) and positions (87) and the current number of yearly graduates (40) are quite small. Few of these programs have been thoroughly evaluated. Data are presented on the type of training sites, educational activities, and clinical interaction at different levels of training. Overall, the nursing home is most frequently used as a training site, and trainees have contact with many health care providers. Information of this kind may be of value to those planning or conducting geriatric programs. The results suggest that there is a persistent need for high quality geriatric programs at all levels of the educational continuum and that such efforts should be evaluated to ensure and improve quality.

In view of the health needs of the steadily increasing elderly population, geriatric training has recently received considerable attention. The American Geriatrics Society (1) and the Institute of Medicine (2) have strongly recommended geriatrics training for medical students and residents, especially those in primary care programs. While specialty recognition has not been endorsed, most groups have recommended training academic geriatricians to conduct research and educational programs in geriatrics (3).

Previous studies have focused on the growth of geriatric training in the United States (4–6). In 1976 very few medical schools required undergraduate courses in geriatrics and gerontology, and only 15 had separate educational programs of any kind (4). By 1979, however, 81 schools reported that they were sponsoring or developing such training activities (6). There is little evidence that the growth of geriatric medical education at the undergraduate and fellowship levels is being matched in primary care residency programs.

A detailed analysis of educational efforts can provide important information for policy-making decisions and aid those wishing to establish programs in geriatrics. The present study was undertaken to update information on the nature and extent of geriatric educational efforts in the United States.

The investigation on which this article is based was supported by contract V101(134)P-710, Office of Academic Affairs, Department of Medicine and Surgery, Veterans Administration.

Dr. Robbins is an assistant professor, Dr. Vivell is an administrative analyst, and Dr. Beck is a professor, Multicampus Division of Geriatric Medicine, Department of Medicine, UCLA School of Medicine, Los Angeles.

Methods

Beginning in November 1979, general requests for geriatric program information were circulated by the authors to all program directors and coordinators identified in the American Medical Student Association (March 1979) and Institute of Medicine (1979) directories. Solicitations were also directed to the academic deans of medical schools unreported in either directory. In this manner, all 126 accredited medical schools were contacted, and within each school multiple leads were followed in order to identify every possible effort in geriatrics. Further, solicitations were directed to specialty societies related to geriatrics and gerontology, to chiefs of staff at each Veterans Administration (VA) medical center, and to individuals known to have an interest in geriatric medical education.

By February 1980 some type of correspondence or other material had been received from 90 medical schools, 20 societies, and 10 VA medical centers. Responses fell into three categories: (*a*) descriptive program and course material; (*b*) statements of interest but no specific materials; and (*c*) statements to the effect that there was no specific course of instruction or developing effort in geriatrics.

While the general solicitations were being made, detailed reporting forms for geriatric programs at the undergraduate, graduate, and fellowship levels were developed by the project staff. The term "program" was defined as any substantive and discrete training activity (for example, lecture series, clerkship, rotation, fellowship) devoted solely or primarily to geriatrics. Major categories of information sought on each program included type of activity, program history, present and future enrollment, sponsorship and funding, faculty, curriculum (including research, administrative, teaching, and clinical activities), educational materials, and evaluation. Some items on the reporting form were prepared as forced-choice responses (for example, amount of time devoted to research, number of faculty members responsible for program), while other items allowed for multiple responses (for example, training sites used, funding sources). A parallel but more detailed form was developed to describe fellowship training.

The forms were pilot-tested by the project staff using actual program material and descriptions received from eight sites.

TABLE 1

Programs in Geriatric Medicine Training Identified and Surveyed, 1979–80

Program	No. of Medical Schools or Other Institutions with Programs*	No. of Programs Identified	No. of Program Surveys Completed	Percent of Identified Programs with Completed Surveys
Undergraduate medical education	76	133	108	81.2
Graduate medical education	35	44	37	84.1
Geriatric fellowship	34	42†	39	92.9
Total	92	219	184	84.0

* The number of accredited medical schools offering geriatrics instruction is 86; the number of nonaffiliated institutions is 6.

† On resurvey for 1981–82, 36 fellowship programs were identified.

They were also modified in response to feedback from 16 experts in the field of geriatrics and gerontology. All data collectors were trained to ensure acceptable levels of interrater reliability ($r \geq .75$).

In March 1980, information previously submitted by a person at each site was transposed onto the program description forms by the project staff. These initially coded forms were then sent to the original respondents for verification of accuracy and completion as needed. Although a few respondents completed the forms and returned them without further comment or contact, in most cases a telephone interview was conducted. The interview allowed for clarification and a more thorough verification of accuracy. Because no site visits were involved, requests for existing program descriptions and interviews to verify the accuracy of the forms were seen as a means of increasing the validity of the data. A second round of solicitations was made, and program description forms were sent to previously unresponsive schools; in cases where the requested information was not received, telephone contact was initiated until responses were received from all medical schools.

Because data collected refers to 1979–80 programs, fellowship positions and funding sources were made current through telephone interviews in May 1981.

Results

A total of 219 programs was identified in 86 medical schools and six institutions not affiliated with medical schools (Table 1). Of the 126 medical schools contacted, 35 reported no specific training in geriatrics, and eight reported that program development efforts in geriatrics were under way.

Of the 92 medical schools and other institutions reporting geriatric programs, 76 reported the presence of 133 programs at the undergraduate level, 35 reported 44 programs at the graduate medical education level, and 34 reported having 42 fellowship programs (Table 1). Only 12 sites, however, reported programs at each of the three levels, while 36 reported training at only one level. At two medical schools and three nonaffiliated sites, the training consisted of annual continuing medical education programs rather than instruction at one of the other three levels.

In collecting data, if only a negligible part of the program description form was completed (typically the program title, instructor, course number, and brief statement of objectives), the investigators tallied the program as having been identified but not surveyed. Of the 219 programs identified, surveys were completed on 184 or 84 percent of the total. Certain items in otherwise completed surveys were often omitted, notably number of trainees and type of program evaluation, and these items were, therefore, not included in the data analysis.

UNDERGRADUATE, GRADUATE PROGRAMS

As shown in Table 2, approximately half of all undergraduate and graduate medical education (GME) programs were instituted as recently as 1979. Relatively few were required activities (9.3 percent for undergraduate programs and 32.4 percent for GME). Within the GME programs, five of eight internal medicine rotations, five of 16 family practice rotations, and two of 10 psychiatry rotations were reported as required. At the undergraduate level, the mean duration of geriatric courses was 6.9 weeks; for graduate medical education the mean was 12.6 weeks. However, there was a large standard deviation, and many rotations were considerably shorter or longer in duration.

Approximately one-quarter of all programs (undergraduate and graduate) had graduated 10 or more trainees since the

TABLE 2

General Characteristics of Undergraduate and Graduate Geriatric Training Programs Surveyed

Characteristic	Undergraduate Medical Education	Graduate Medical Education
Beginning of program		
Prior to 1970	0	0
1970-1972	3	5
1973-1975	6	2
1976-1978	26	8
1979-1981	57	16
Unreported	16	6
Program status		
Required	10	12
Elective	89	25
Selective	9	0

inception of their courses. However, over half of the programs surveyed did not report the number of current or past trainees. In 50 of 108 undergraduate programs and 15 of 37 graduate programs, two or fewer faculty members had day-to-day program responsibilities.

Fifty-six of 63 programs surveyed for clinical medical students (medical students undertaking clinical rotations generally in the third and fourth year) and 34 of 37 graduate medical education rotations reported on the nature of clinical activities for trainees. At both levels, primary patient care and clinical conferences were reported as relatively frequent geriatric training activities (45 of 56 and 28 of 34 respectively). Team rounds and consultation and liaison activities were also found in over half of these programs.

From a list of 20 categories of medical and allied health personnel, medical students in their clinical years were reported to have some type of contact with an average of 10.2 categories of providers. For graduate medical education, the average contact with medical and allied health disciplines was 11.5. Social workers (45 of 55 programs) and registered nurses (44 programs) were the health providers with whom clinical medical students had the most contact, followed by internists (41 programs) and psychiatrists (41 programs). This pattern also held true for the graduate medical education level; contact with social workers (27 of 30 programs) and registered nurses (25 programs) was followed by contact with psychiatrists (24 programs) and internists (23 programs).

Clinical training sites for students, residents, and fellows are displayed in Table 3. For students and residents alike, the nursing home was the most frequently used site. Geriatric evaluation units, geriatric clinics, and home care programs were other sites often used for both clinical undergraduates and residents.

FELLOWSHIPS

As with geriatric training at the undergraduate and graduate medical education levels, the great majority of fellowship programs are of recent origin. Specifically, of 36 fellowship programs reporting their program histories, only two existed prior to 1970, and only one more had begun by 1975. Nine programs were initiated from 1976 through 1978, and 24 (two-thirds of the number of respondents) were begun in 1979 or later. The average duration of geriatric medicine fellowships was two years; for geropsychiatry programs, the average duration was one and one-half years.

The mean number of faculty members

TABLE 3

Geriatric Training Sites in Order of Decreasing Frequency for all Programs

Training Sites*	Percent Clinical Medical Students ($n = 59$)	Percent Graduate Medical Education ($n = 34$)	Percent Geriatric Medicine Fellowships ($n = 25$)	Percent Geropsychiatry Fellowships ($n = 13$)
Nursing home	76.3	52.9	72.0	46.2
Geriatric evaluation unit	40.7	35.3	68.0	
Geriatric clinic	35.6	35.3	80.0	
General medicine ward		47.1	60.0	
Senior citizen center	40.7			
Patient's home	32.2			
Home care program	32.2	26.5		
Rehabilitation ward			44.0	
Geropsychiatry ward		26.5		53.8
Psychiatry ward				46.2
Psychiatric clinic				69.2
Integrated health and social service center				30.8

* Other training sites included day care center, retirement home, family practice unit, general medical clinic, hospice, outpatient geriatric evaluation unit, surgical and other specialty wards, neighborhood health clinic, private practice, and public health clinic.

with daily fellowship program responsibility was 3.9, with 11 of 33 programs responding to the question reporting that day-to-day responsibility resides with one or two individuals. Of 22 geriatric medicine fellowships responding, 17 reported that faculty members with program responsibility had specialized in internal medicine, eight reported faculty members who specialized in psychiatry, and six reported faculty members who specialized in neurology. Family practitioners were identified in two programs, and in only four programs were responsible faculty members identified as "geriatricians." In all 13 geropsychiatry fellowships surveyed, psychiatry was the primary discipline of faculty members with major program responsibility.

As a prerequisite for prospective applicants, fellowships generally required training in internal medicine, psychiatry, and/or family practice. Ten of 11 geropsychiatry programs required an average of three years of training in psychiatry, while 23 of 24 geriatric medicine programs looked for three years in internal medicine and 20 of 24 considered candidates with three years of family practice.

When geriatric fellowships were surveyed as to various activities for fellows, all 39 programs reported some research activity on the part of trainees, 21 provided for up to 24 percent of the total time in research, 13 programs had their fellows spending 25 to 50 percent of their time in research, and one program reported fellows spending over half of their time in research. Of the fellowship programs reporting some type of research activity for trainees, basic biomedical and health services research received equally high attention (27 programs each) followed by psychosocial research (20 programs). Educational research was reported for the trainees of eight fellowships. All programs reported lectures, readings, and/or seminars for fellows, 32 of 39 programs reported teaching duties for fellows, and 30 of 39 reported some administrative responsibilities (defined as program administration, budget preparation, staff management, and or committee involvement).

Major clinical activities of fellows included participation in primary patient care (35 of 36 programs), consultation and liaison (32 of 36), clinical conferences and team rounds (30 of 36), and clinical teaching rounds (28 of 36). Out of 20 categories of medical and allied health professionals, fellows had contact with an average of 10.3 categories of providers in health care teams and 12.3 on an individual basis. Fellows had the most frequent contact with registered nurses, internists, and occupational therapists (36 of 38 programs), and psychiatrists and social workers (35 of 38).

Clinical training sites for fellows appear in Table 3. As would be expected, fellows were trained in more settings than undergraduates and residents. Aside from the use of nursing homes, the emphasis, however, is considerably different for geriatric medicine and geropsychiatry.

With regard to program evaluation, 17 of 25 fellowship programs (25 of 34 respondents) reported that they conducted evaluations, and the remaining eight reported that program evaluations were in the planning stage. Of the programs conducting evaluations, all reported faculty or supervisor review as an assessment technique. Other frequently used methods included review of fellows by medical students (11 programs), chart or other record review (10 programs), and peer review (8 programs).

Current fellowship programs resurveyed in May 1981 are displayed in Table 4. The total number of fellowship positions reported for the 1980–81 academic year was 87; for 1981–82, the number has increased to 94. Of the 87 positions available in 1980–81, 75 (86.2 percent) were reported filled. This number includes 48 first-year fellows, 26 second-year fellows, and one fellow in the third year. In July 1981, 40 fellows were expected to complete their programs. As of May 1981, 80 (85.1 percent) of the available positions for 1981–

TABLE 4

Geriatric Fellowship Positions and Funding Reported by 25 Programs in Geriatric Medicine and 11 Programs in Geropsychiatry, 1980–81

Fellowship/Funding	Geriatric Medicine	Geropsychiatry
Fellowships		
Positions available	67	20
Positions filled*	58	17
Fellows graduating July 1981	28	12
Funding Sources of Positions†		
Veterans Administration	32	2
Hospital supported	14	1.4
Medical school and department funds	5	2.8
National Institute of Mental Health		6.8
Administration on Aging	5.25	
Henry J. Kaiser Family Foundation	3.75	1.0
National Institutes of Health	3.00	
Other public	1.00	6.00
Other private	3.00	

* For the cycle beginning July 1981, 48 new fellows (39 in medicine and 9 in geropsychiatry) were reported to be enrolled.

† A position is defined as a full salaried fellowship as determined by the program and not the funding source.

82 had been filled. Funding for 1980–81 fellowship positions was supplied by both the public and private sectors. The Veterans Administration provided much of the funding for geriatric fellowships.

Discussion

The study reported here is a comprehensive attempt to characterize the current status of geriatric education in the United States. Although the data collected were not verified by on-site visits, they are likely to reflect in a relatively accurate way current educational programs in geriatrics. The survey instruments were extensive, and efforts were made to confirm information through telephone interviews. When data reported were grossly inadequate, as occurred in 35 (16 percent) of the 219 cases, the program was not included in the survey. Moreover, when specific pieces of information were incomplete on the forms, the items were omitted from that particular analysis.

Compared with the most recent estimates (4), the total number of programs available appeared to have increased substantially within the past two years, especially at the medical school level. However, the number of training efforts at all levels was still quite small. While 108 medical school programs were surveyed, most were elective (82.4 percent). At the GME level, very few programs (44 of them) existed in comparison with the number of residencies in internal medicine, family practice, and psychiatry (approximately 1062 residency programs in 1980) (7). Of those identified, only one-third were required rotations.

The many programs reporting neither the number of previous trainees nor the number of current trainees probably reflects not only the fact that many programs are only now seeing their first trainees but also the fact that most programs have had few trainees altogether.

Similarly, the number of faculty members with day-to-day responsibility in the programs was low; two or fewer faculty members were charged with responsibility for almost half the programs surveyed. Current efforts in geriatric undergraduate and graduate medical education can be characterized as recently emerging, largely elective, undersubscribed, and with relatively limited faculty involvement. Of 126 medical schools, fewer than half had discrete courses for medical students, and only 12 schools had geriatric training at all levels.

Analyses of the geriatric fellowships reveal some interesting characteristics. There seemed to be rather discrete training tracks for geriatric medicine and geropsychiatry. Many of the former were funded by the Veterans Administration and the latter by the National Institute of Mental Health. Only a small percentage of faculty members in these programs had specialty training in geriatrics, and the core specialties appeared to be internal medicine, psychiatry, and family practice in descending order of frequency. Clearly, geriatric medicine programs were staffed primarily by internists. A relatively small percentage of programs reported nonphysician faculty members, even though the practice of geriatrics is heavily interdisciplinary.

Most fellowship programs had been developed in the past several years. Prerequisite training for geriatric medicine fellowships was mainly in internal medicine, family practice, or, to a lesser extent, psychiatry and neurology; for geropsychiatry, the training track was usually psychiatry. As in many subspecialty fellowships, considerable training (an average of three years) and board certification were preferred in geriatrics.

Most fellowships provided broad training in clinical care, administration, and teaching and apparently were not highly research oriented. Indeed, very few allowed for 50 percent or more research time during the fellowship. If the primary purpose of these programs is to provide academic geriatricians, as is stated in the Institute of Medicine report, then more time should be allowed for research, or the fellowship should be expanded to a third year.

In most geriatric training programs for students, residents, and fellows, there was contact with many health providers and exposure to the health care team. Such exposure is essential for trainees and is central to providing high level care to the elderly. For students and residents, the nursing home was the usual training site, though a variety of different settings were utilized. A nursing home or home care setting for the aged is very appropriate for training but only if the training site functions optimally. It is unfortunate that students and residents have little opportunity for longitudinal patient care, which is necessary for them to appreciate fully the problems of chronic disease and interaction of psychological, social, and economic factors.

In approximately half of all programs surveyed there was some type of program or trainee evaluation. Most of the evaluations were quite rudimentary, and very few programs collected objective data on the effectiveness of their educational efforts or on the knowledge, skills, and attitudes of their trainees. In the new and rapidly expanding field of geriatrics, it is essential that training efforts be evaluated early so that programs can be modified to ensure a high level of trainee competence.

The results of the present study suggest that while there has been an overall increase in geriatric educational programs, the quantity and quality of training, especially at the undergraduate and graduate levels, are still considerably substandard. More required training with well conceived, high quality clinical work is needed. More geriatric faculty members are necessary to provide a meaningful experience. The number of graduates of geriatric fellowships is still substantially below projected manpower needs, even for those planning careers in research and teaching. Moreover, the competence of the graduates has usually not been assessed, especially in regard to academic careers in geriatrics. Recent reports of increasing attention directed at geriatric training should not lead anyone to believe that enough has been accomplished. The evidence indicates that there is still considerable need to improve educational efforts.

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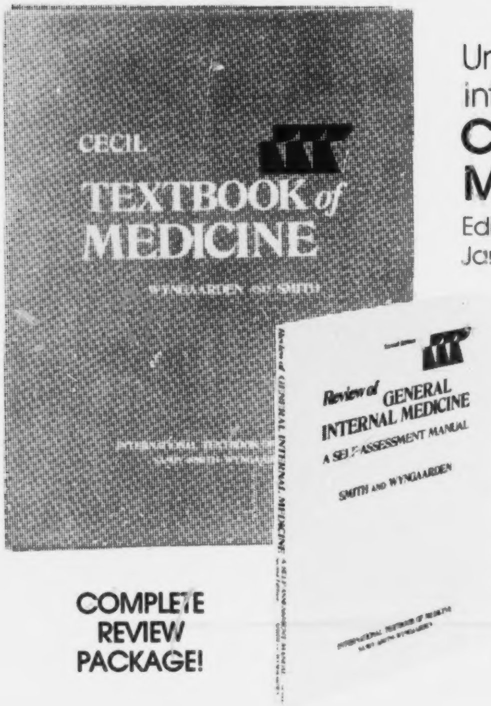

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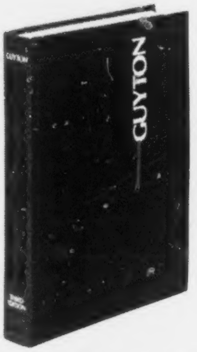

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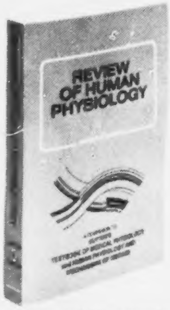

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Promotion Criteria: Perceptions Of Faculty Members and Departmental Chairmen

Craig L. Gjerde, Ph.D., and Sandra E. Colombo

Abstract—Medical school promotions committees tend to depend heavily on departmental evaluations of candidates for promotion. Unfortunately, departments often lack clear promotion guidelines; this results in confused perceptions of promotion criteria. Faculty members and department chairmen do not always see eye to eye. When asked to indicate which activities contributed the most toward achieving promotion to higher academic rank, faculty members in a large midwestern medical school perceived research to be the single most important activity. Departmental chairmen had a broader perception, however, and included research, teaching, patient care, and administration/service in their list of desirable and essential activities. Faculty members and chairmen differed significantly ($p < .01$) in their mean ratings on 12 of 69 activities. Such perceptual discrepancies can lead to conflict and disagreement that can be avoided by straightforward explanations of promotion criteria and more clearly defined job descriptions and time allocations.

Faculty members in medical schools are usually recruited and hired by departmental chairmen. Typically, new faculty members are advised that their success in academics will depend on their performance in four areas: teaching, service, research, and patient care. Faculty assignments in the areas of service, teaching, and patient care are usually made by the department chairman. On the other hand, research activities, while often an important factor in recruitment, are usually selected and conducted independently by faculty members. If a faculty member does well in these four designated areas of faculty responsibility, after a few years the chairman may choose to nominate him to the medical school promotions committee as a candidate for promotion to a higher academic rank.

While it is recognized that the decision to promote a faculty member to a tenured position may involve both the individual's merit and his value to the institution (1) (for example, the institution may value a competent female physician as a role model), traditional approaches to faculty evaluation have not always included this distinction. Faculty evaluation for promotion is typically conducted by a group of faculty members (the promotions committee) who too often consider only the merit, or "paper qualifications," of the

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This study was supported by a grant from the National Fund for Medical Education.

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For related editorial, see page 200.

individual without taking into account the individual's value to his profession and/or department, which may be difficult to measure. The promotions committee necessarily depends heavily on the evaluations and recommendations of departmental chairmen. Unfortunately for both institutions and faculties, however, departments tend to lack clear and adequate guidelines for promotion (2).

The chairman-as-mentor system can work smoothly if the chairman and the faculty member share common perceptions about the activities that fulfill the medical school's criteria for promotion. When the chairman and the faculty member have different perceptions about what activities "count for promotion," conflict and disappointment can result. Vague guidelines tend to blur distinctions between ideals and reality. This study compares the perceptions of faculty members and departmental chairmen about what activities are in fact important as criteria for promotion.

Methods

Over 100 interviews were conducted with faculty members and department chairmen at a large midwestern medical school to identify perceptions about the faculty activities that contributed most toward promotion (3). From the criteria suggested by these interviews, a questionnaire listing 69 activities was constructed. Of these activities, 41 were subsumable under the four major areas of faculty responsibility; the other 28 activities (hereafter called other attributes) dealt with personal qualities and behaviors.

Faculty members and chairmen at the same school were mailed the survey questionnaire and asked, "How do the following activities apply as criteria for promotion in your department?" There were six potential responses: detrimental, undesirable, no effect, desirable, essential, and not sure. For analysis, the responses "detrimental" through "essential" were scaled as 1 through 5; "not sure" was combined with "no effect" to form a neutral midpoint category with a value of 3.

Results

The mean ratings given each activity by 393 faculty members (80 percent response rate) and by the 22 chairmen (100 percent response rate) are shown in Table 1. A multivariate comparison of the two sets of ratings indicated that there were some differences ($p < .05$) worthy of further investigation. Chairman and faculty means for each item were then compared using analysis of variance. If a mean rating of 4.0 is considered a cutting score for identifying the desirable or essential faculty activities, it can be seen that the faculty placed 11 activities in that category. Of these 11 highly rated activities, eight were related to research, one was related to service ("accept responsibilities delegated by your chairman"), none were related to either teaching or patient care, and two were related to other attributes ("be professionally respected by your chairman" and "be professionally respected by department members").

Chairmen, on the other hand, judged nearly twice as many activities—a total of 19—to be desirable or essential (Table 2). These 19 activities included eight related to research, four to teaching, one to patient care, two to service, and four to other attributes of person or situation ("be professionally respected by department members," "be professionally respected by your chairman," "have strong letters of reference from recognized experts in your field," and "maintain a professional image"). Of the 69 activities included in the survey, 46 showed no significant differences between the ratings of the faculty

TABLE 1

Rating of Activities as Criteria for Promotion by Faculty Members and Chairmen

Activity*	Mean†	
	Faculty Members (N=393)	Chairmen (N=22)
Be the primary author of journal articles	4.66	4.86
Publish articles in refereed journals	4.65	4.77
Publish articles that make a contribution to the field	4.47	4.55
Publish a certain number of articles each year	4.30‡	3.64
Present papers at professional meetings	4.24	4.43
Achieve national recognition for research	4.23	4.14
Be professionally respected by your chairman	4.22	4.32
Accept responsibilities delegated by your chairman	4.13	4.36
Be professionally respected by department members	4.12‡	4.64
Conduct lab-oriented research	4.07	3.91
Generate dollars to support research efforts	4.07	4.05
Conduct replicable research	3.94	4.36
Present papers by invitation at professional meetings	3.89	4.05
Have at least three years at the current academic rank	3.87	3.67
Maintain a professional image	3.82	4.18
Serve on departmental committees	3.78	4.00
Have high visibility within the academic community	3.75	3.82
Teach medical students	3.74	4.27
Have an influential chairman	3.74	3.48
Conduct clinically oriented research	3.72	3.64
Write textbooks	3.71	3.95
Teach graduate students or house officers	3.70§	4.18
Have strong letters of reference from recognized experts in your field	3.69‡	4.23
Be personally liked by your chairman	3.68	3.50
Be a member of a national review committee: for example, National Institutes of Health	3.68	3.91
Do an excellent job of teaching	3.68‡	4.23
Conduct research which is supportive of the department's direction	3.68	3.67
Be a member of an editorial board	3.66	3.77
Have high visibility within your department	3.65	3.62
Be personally liked by department members	3.65	3.82
Have a pleasing personality	3.61	3.59
Get outside employment offers from institutions of similar prestige	3.60	3.50
Profess congruence with departmental goals and norms	3.60	3.73
Receive teaching award(s)	3.60	3.82
Serve on medical school committees	3.60	3.77
Be an innovative teacher	3.58‡	4.05
Get favorable student evaluations for teaching	3.58	3.91
Achieve national recognition for teaching	3.56	3.86
Participate on university committees	3.55	3.77
Provide competent patient care	3.54§	4.05
Be a good administrator	3.53	3.62
Teach formal courses	3.52	3.82
Have high visibility within the medical school	3.52	3.59
Follow regular channels to solve problems in your department	3.50	3.82
Participate in grand rounds	3.43	3.68
Participate in interdisciplinary projects or programs	3.43	3.68
Be a course director	3.42	3.52

(*Continued on next page*)

TABLE 1—continued

Activity*	Mean†	
	Faculty Members (N=393)	Chairmen (N=22)
Achieve national recognition for patient care	3.42	3.71
Conduct ward rounds	3.41	3.64
Don't challenge what the department chairman tells you to do	3.39§	2.90
Conform to the social norms of the department	3.39	3.29
Teach practicing physicians	3.37	3.62
Be a section chief	3.36	3.18
Be aggressive	3.35	3.14
Socialize with others in the department	3.33	3.29
Be advised by a senior faculty member on getting through the system	3.29	3.90
Be a member of an inner group within your department	3.27§	2.86
Participate in committees outside the university	3.26§	3.68
Have both M.D. and Ph.D. degrees	3.25	3.14
Have high visibility outside the academic community	3.25	3.41
Counsel students	3.23‡	3.91
Teach six-year B.S./M.D. students	3.21	3.32
Negotiate promotion when hired	3.21§	2.71
Teach students in other health professions; for example, nursing, dentistry, allied health	3.15	3.36
Teach undergraduate students in liberal arts	2.97	3.05
Hold a joint appointment	2.91	2.95
Have a heavy formal teaching load	2.76	2.86
Pursue research interests which differ from departmental interests	2.75	2.81
Get unfavorable student evaluations for teaching	2.24	1.86

* Activities are ranked by faculty mean ratings.

† 5=essential, 4=desirable, 3=no effect or not sure, 2=undesirable, and 1=detrimental.

‡ $p < .001$ (one-way analysis of variance between chairmen and faculty members).

§ $p < .01$ (one-way analysis of variance between chairmen and faculty members).

members and those of the departmental chairmen ($p > .05$), 11 differed moderately ($p < .05$), and 12 differed significantly ($p < .01$). Since out of these 69 comparisons three or four could appear significant by chance variation alone (using alpha equal to .05), only the 12 differences whose chance likelihood was less than 0.01 will be discussed further.

In their perception of the promotion system, faculty members placed much greater emphasis than chairmen on publishing a certain number of articles each year ($p < .001$). They also placed significantly more emphasis ($p < .01$) on three other attributes relating to manipulative behaviors—negotiating promotions when hired, being a member of an inner group in the department, and not challenging what the department chairman asks them to do. (Chairmen assigned these last three activities ratings just lower than 3.0, denying in effect that such behaviors make much difference either way.)

Departmental chairmen rated eight activities significantly higher ($p < .01$) than the faculty. Counseling students and participating on committees outside the university were considered moderately important by the chairmen but of relatively low importance by faculty members. The other six activities rated significantly higher by chairmen were activities which they perceived to be desirable or essential for pro-

TABLE 2

Essential and Desirable Activities for Promotion as Ranked by Departmental Chairmen

Rank	Activity
1	Be the primary author of journal articles
2	Publish articles in refereed journals
3	Be professionally respected by department members
4	Publish articles that make a contribution to the field
5	Present papers at professional meetings
6	Accept responsibilities delegated by your chairman
7	Conduct replicable research
8	Be professionally respected by your chairman
9	Teach medical students
10	Have strong letters of reference from recognized experts in your field
11	Do an excellent job of teaching
12	Maintain a professional image
13	Teach graduate students or house officers
14	Achieve national recognition for research
15	Generate dollars to support research efforts
16	Present papers by invitation at professional meetings
17	Be an innovative teacher
18	Provide competent patient care
19	Serve on departmental committees

motion: "be professionally respected by departmental members," "teach graduate students or house officers," "have strong letters of reference from recognized experts in your field," "do an excellent job of teaching," "be an innovative teacher," and "provide competent patient care."

Discussion

In this study departmental chairmen and faculty members both recognized the importance of research, publication, and professional respect for faculty members who aspired to promotion to a higher academic rank. Chairmen, however, had a much broader view of what activities were important; they identified as desirable or essential activities from all four areas of faculty responsibility. However, the question is whether a faculty member would be willing to devote adequate time to those activities, such as serving on departmental committees or teaching medical students, that he perceived as contributing little toward his promotion. At the same time, if a departmental chairman believed that those activities were desirable or essential experiences for a faculty member to have, he would surely want to give each faculty member ample opportunity to achieve them. Differences of opinion about what activities are important can lead to confusion, misplaced emphases, and, eventually, terminal appointment for the faculty member who fails to perform to the institution's expectations.

One explanation for these discrepant opinions about what counts for promotion is that faculty members too often see only the institutional-level review conducted by the medical school promotions committee. At many large universities this institutional-level review appears to be based mainly on "scholarly activities" (that is, research and its publication). The institutional promotion committee may assume that the faculty member's teaching, patient care, and service (which are administered and conducted through the department) have been thoroughly assessed during an earlier departmental-level review. Responses to another component in this study indicate that many faculty members were also confused about procedures in the promotion process and were sometimes totally unaware that their departmental promotions committee was reviewing their credentials. This unawareness, while it may be somewhat surprising, does help to explain the heightened visibility of the promotion deliberations conducted at the institutional level.

Such confused perceptions of promotion criteria have some unfortunate, if not disastrous, implications for faculty performance in certain areas. At the very least, they are indicative of a considerable communications gap between faculty members and departmental chairmen that can be as detrimental to departmental function and to medical education as to faculty success. Three administrative steps may lessen these confusions. First, the chairman should explain to each new faculty member the criteria for promotion at both the departmental and institutional levels; this is the faculty member's equivalent to informed consent. Second, the chairman should annually negotiate a job description and time allocation with each faculty member; this job description should allow the faculty member to participate in all desirable and essential activities and should be the basis for the faculty member's evaluation for promotion. Third, the institutional promotions committee should insist on reviewing these annual job descriptions and evaluations as a part of its deliberation about the qualifications of the person being considered for promotion.

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The Predictive Value Of the Premedical Grade-Point Average

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Abstract—The study reported here assessed the relative utility of premedical grade-point average (GPA) in distinguishing among prospective medical students and in predicting the medical school performance of accepted applicants. Students from each of two medical classes were grouped into one of four categories depending on the "selectivity" rating of their premedical, undergraduate institution. Group differences were assessed according to premedical GPAs, Science subtest scores of the Medical College Admission Test, medical school course work, and scores on the Part I and Part II examinations of the National Board of Medical Examiners. Results indicated that although the groups differed significantly on premedical GPA (with mean scores from the less competitive undergraduate colleges exceeding those of the most selective schools), on all other dependent measures no significant differences resulted. It was concluded that "raw" premedical GPA is susceptible to a number of extraneous sources of variance that, unless identified and eliminated, negate its effectiveness in assessing individual differences in past academic achievement and in predicting future medical school performance.

Although the undergraduate medical college is beginning to experience a decrease in the number of applicants for the first-year student positions, it nonetheless is still experiencing a relatively large absolute number of applicants. Faced with the situation of having many qualified applicants but a limited number of positions, admissions committees must identify relevant variables that allow accurate prediction of successful futures in medical school. Fortunately, a wealth of practical experience combined with numerous empirical studies have consistently identified several predictor variables that demonstrate a positive relationship with performance measures in medical school (1–5).

Repeated experiences with these variables have demonstrated such consistent predictability (or lack of it) of medical school performance that individual admissions committees have been able to create a hierarchy of predictors, weighting and placing them into regression equations in order of their relative utility in predicting desired academic outcomes (6).

Since previous research has adequately demonstrated differences in predictive utility among predictor variables, it is unnecessary to reiterate their predictive order here. However, it is important for admissions officers to be aware that individual differences within a specific predictive

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measure may be inappropriately exaggerated by extraneous sources of variation that serve to reduce the variable's predictive accurateness.

A predictor that may demonstrate large individual variation is undergraduate (premedical) grade-point average (GPA). A strong possibility exists that the observed variation is not a result of actual individual differences in academic abilities, but may be due to some extent to such extraneous factors as educational discrepancies in the undergraduate institutions and the differing grading philosophies. Consequently, since the variable which admissions officers are primarily interested in is academic ability and not nuances of the undergraduate institution, it is imperative that each medical school arrive at some solution to this problem so that accurate and fair consideration is given to all applicants.

A number of possible solutions already exist and have been suggested in part elsewhere (7). First, it is possible to consider a student's "raw" GPA as it stands without making any modifications based on his undergraduate institution. However, such an approach ignores the fact that disparate grading practices across institutions in essence indicate that different measuring instruments are being used or even that different variables are being measured. A second possible solution suggests a molar qualitative decision based on the quality of the undergraduate institution itself. For example, at relatively equal levels of undergraduate GPAs, those that were earned at a large private institution may be better indicators of medical school success than those obtained at a small liberal arts college. GPAs at a small liberal arts college, in turn, may be better predictors than those obtained at a state university. However, such an approach is erroneous in that it measures the quality of the institution instead of the quality of the applicant. Although "undergraduate college attended" may in itself be a viable predictor of performance in medical school and should certainly be considered in the admissions context, it is not the major component of an individual's academic course performance. Finally, it is possible to utilize information concerning qualitative differences among undergraduate institutions in suggesting logical and statistical modifications of GPA data for purposes of predicting medical school performance. Such techniques may include the assignment of beta weights, derived from regression analyses on previous medical classes, to new predictive equations with applicant GPA data. Or, a numerical constant could be added to those GPAs which appear "deflated" in comparison with others but which were earned at a prestigious institution.

It is the contention of the author that before any strategy is employed in reinterpreting the GPA variable a number of concerns must be initially addressed. First, it is necessary to demonstrate whether significant differences in GPA do, in fact, exist among medical students from different "types" of undergraduate colleges. Second, it must be determined whether any existing premedical GPA discrepancies provide the basis for accurate prediction of future similar discrepancies on medical school performance measures. Finally, the information concerning the nature of any academic discrepancies at entrance and during medical school must be weighted individually by each individual medical school to determine the premedical GPA interpretation most appropriate for its admissions procedures.

The purpose of the study reported here, then, was (*a*) to examine whether entering medical students in one medical school differed in premedical GPA based on their undergraduate schools (and, if so, to what extent); (*b*) to examine the extent to which observed differences in undergraduate GPA were replicated in medical school performance and performance on the Part I and Part II examinations of the National Board of Medical Examiners (NBME); and (*c*) to suggest specific means by which any GPA variation caused by the undergraduate college can be accurately evaluated in the admissions process.

Methods

Subjects in the study included 103 students from the graduating class of 1979 and 91 students from the graduating class of 1980 of the State University of New York at Buffalo (SUNYAB) School of Medicine. For each entering year of a class of 135 persons, all subjects on whom complete data were available were included in the study. Subjects within each class year were considered as separate replications of the same study, with subsequent comparisons and analyses performed separately within each of the two classes. Since it was thought that the two classes represented two distinct experimental populations encountering slightly different course material and dependent measures, it was decided to study samples from each population separately in the hope that this would provide a degree of generalizability not available without such replication.

The students were measured on three general sets of dependent measures. The first set consisted of premedical school data: their score on the Medical College Admission Test (MCAT) Science subtest and both their undergraduate science GPA and undergraduate total GPA (both GPAs measured on a 4.0 scale with A = 4.0). The second measure was their performance in the basic science course work of the first two years of the undergraduate medical curriculum. The subjects' final grades in 15 courses were recorded as three-digit standard scores (mean = 500, S.D. = 100), which represented mean scores of all examinations within each course. The third set of dependent measures consisted of performance on Part I and Part II of the NBME examinations. The subjects' standard scores were recorded for the seven basic science subscales and total score of the Part I exam. Similarly, on Part II, the subjects' standard scores were recorded for the six clinical science subscales and for the total score.

To determine whether students from various types of undergraduate institutions perform significantly differently on the dependent measures, subjects were classified according to the "selectivity" of the college they attended. The classification system employed was Barron's College Admissions Selector (8). This classification index groups undergraduate colleges and universities according to the degree of competition for admission. The Barron index uses these criteria: "median entrance examination scores for the most recent freshman class (Scholastic Aptitude Test [SAT] scores are averages of verbal and mathematical; American College Testing [ACT] scores are composite); percentage of students scoring above 500, above 600, and above 700 on both the mathematical and verbal sections of the SAT; grade average or class rank required for admission; and the proportion of applicants that the college offered acceptance to, especially when there were many more applicants than could be accepted." It carries this disclaimer: "The Selector is not a rating of colleges by academic standards or quality of education; it is rather an attempt to describe, in general terms, the situation a prospective student will meet when he applies for admission." However, in reality, the level of selectivity of an applicant's undergraduate college in the Barron's Selector is often used as a factor in the medical school admissions decision. Consequently, in the study reported here subjects were classified as members of one of four groups, based on their college's categorization in the Barron's system. The colleges attended by the subjects encompassed the top four categories of the Barron's Selector. The specific descriptive criteria for each of these categories are summarized elsewhere (8).

In descending order, from the most selective to the lesser selective categories, in the 1979 data this classification resulted in 31 students in the "most competitive" category; 15 students in the "highly competitive" category; 31 in the "very competitive" category; and 26 in the "competitive" category. The numbers for the class of 1980 were: most competitive, 22; highly competitive, 19; very competitive, 27; and competitive, 23.

To determine whether significant differences in premedical GPA exist between the four categories of undergraduate colleges represented in each of the SUNYAB medical classes of 1979 and 1980, univariate analyses of variance were performed among the four groups on both undergraduate science GPA and on undergraduate total GPA. In addition, univariate analyses of variance were performed between the four groups on MCAT Science subtest scores.

To determine whether differences exist between the four college categories in academic performance in medical school course work, multivariate analyses of variance were performed among the groups on both the set of eight first-year courses from the student's medical curriculum at SUNYAB and the set of seven second-year SUNYAB courses. Univariate analyses of variance were also performed among the groups on all 15 courses in order to determine whether there were any specific substantive trends of statistical significance. Similarly, in order to determine whether differences exist among the groups in performance on standardized tests of the same academic material, multivariate analyses of variance were performed on both the seven subscales of the NBME Part I examination and on the six subscales of the NBME Part II exam. In addition, separate univariate tests of significance were performed on each subtest and on total score for both Parts I and II.

Results

Means and standard deviations for the four group's undergraduate science GPAs and undergraduate total GPAs for both the class of 1979 and the class of 1980 are presented in Table 1. Examination of the

TABLE 1

Means and Standard Deviations of Premedical Science GPA, Premedical Total GPA, and MCAT Science Scores of Classes of 1979 and 1980, State University of New York at Buffalo School of Medicine

Selectivity Rating of Undergraduate College	Science GPA		Total GPA		MCAT Science	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Medical Class of 1979						
Most competitive	3.17	0.54	3.26	0.44	601.5	75.4
Highly competitive	3.24	0.42	3.37	0.27	618.3	67.8
Very competitive	3.46	0.20	3.49	0.17	653.1	58.7
Competitive	3.62	0.28	3.64	0.24	608.5	83.8
Medical Class of 1980						
Most competitive	3.41	0.41	3.40	0.29	634.6	74.5
Highly competitive	3.51	0.40	3.52	0.36	613.0	74.9
Very competitive	3.61	0.20	3.64	0.15	634.1	53.5
Competitive	3.75	0.27	3.75	0.23	609.1	64.6

mean scores reveals that in both classes, on both measures of GPA, the mean order by magnitude runs in reverse order of categorical college ranking, with the competive group having the highest mean scores and the most competitive group the lowest mean scores. In the 1979 data the omnibus test of significance between these mean values resulted in a statistically significant F value of 7.740 (*df* = 3, 99; $p <$ .01) for the science GPA variable and a statistically significant F value of 8.019 (*df* = 3, 99; $p < .01$) for the total GPA variable. Similarly, in the 1980 data statistical significance was found on both dependent variables with a resulting F value of 4.632 (*df* = 3, 87; $p < .01$) on science GPA and an F of 7.212 (*df* = 3, 87; $p < .01$) on total GPA.

To further address the issue of whether higher premedical GPAs indicate better past achievers and better prospective medical students, the mean MCAT Science subtest scores of the four college categories were compared. In the 1979 MCAT Science data, significant differences did occur (F = 3.076; *df* = 3, 99; $p < .05$). However, the MCAT mean ordering by magnitude differed from that in the GPA data. Instead of following the reverse order of college categorical ranking as before, the mean order from highest to lowest was very competitive, highly competitive, competitive, and most competitive (Table 1). In the 1980 MCAT data no statistical significance was obtained (F = 1.101; *df* = 3, 102; $p = .35$), and the mean orderings are also presented in Table 1. (In the 1980 MCAT Science data, 106 subjects were available for analysis. Their categories were: most competitive, 26; highly competitive, 20; very competitive, 33; and competitive, 27.) This absence of consistent and significant trends in the MCAT data may cast doubts as to the accuracy of the premedical GPA as a uniform measure of academic ability. Since all of the subjects in these analyses were students in medical school and not rejected applicants, it is reasonable not to find significant differences between groups on various predictor measures. Therefore, the fact that the GPA analyses did find significance but did not resemble the results of the analyses on the more reliable MCAT arouses some doubt as to the predictive utility of premedical GPA.

The issue of predictive utility was further addressed in the analyses of academic performance in medical school. The multivariate analyses of variance between the four college categories on the set of eight first-year medical courses yielded no statistical significance in both the 1979 data ($F_{mult} = 1.219$; $p = .22$) and in the 1980 data ($F_{mult} = 0.907$; $p = .59$). In addition, the eight univariate analyses in the 1980 data were all nonsignificant, and only one of the eight (histology) in the 1979 data resulted in significance (F = 2.988; *df* = 3, 99; $p < .05$). However, in the mean ordering in the histology analysis, the competitive group dropped to the third highest among the four college categories, from its position of the highest group mean in the premedical GPA analyses. The multivariate analyses of variance among the four groups on the set of seven second-year courses were also nonsignificant for both the 1979 ($F_{mult} = 0.742$; $p = .79$) and 1980 data ($F_{mult} = 1.040$; $p = .42$). As expected, all seven univariate analyses in both years were also nonsignificant. In both years in all of the analyses on students' performance in medical school, the mean orderings for the four college groups followed no consistent pattern or a pattern predictable from the previous significant premedical GPA analyses. That is, the competitive group which demonstrated a higher premedical GPA did not continue to demonstrate higher achievement in medical school be it statistically significant or not.

Multivariate analyses of variance on the seven subscales of the NBME Part I exam showed no significant differences in either the 1979 ($F_{mult} = 0.578$; $p = .93$) or 1980 data ($F_{mult} = 0.713$; $p = .71$). Similarly, the multivariate analyses of variance on the six subscales of the NBME Part II exam resulted in no significance. In the 1979 data, $F_{mult} = 0.742$ ($p = .77$), and in the 1980 results, $F_{mult} = 1.106$ ($p = .44$). As expected from these results, in both years the univariate analyses on each subtest and total score considered separately were nonsignificant. Again, the mean orderings followed no consistent or predictable pattern.

In summary, across two class years, of 60 univariate tests of significance assessing mean differences among four undergraduate college categories on a variety of medical school academic measures, only one test resulted in statistical significance. Furthermore, the direction of the observed mean orderings in the one significant result was different than expected from the previous statistically significant findings between the college groups on undergraduate GPA.

Conclusions

The results of this study indicated that within the SUNYAB data significant differences in undergraduate GPA did exist among the categories of undergraduate institutions suggested by Barron's Selector. However, these group differences were not observed in the Science subtest of the MCAT, nor did they continue to manifest themselves in course work in medical school or in the NBME examinations. The immediate implications of these results are an affirmation of earlier findings that "raw" premedical GPA is not a particularly successful predictor of academic success in distinguishing among students accepted to medical school (9). If premedical GPA were a reliable predictor, similar significant results (or at least similar mean orderings) should have occurred in both the GPA and medical school performance analyses. The fact that the significant mean GPA orderings favored the "less selective" undergraduate institutions but failed to recur in medical school performance suggests that some sort of adjustment to raw GPA should be made on the basis of institutional selectivity before premedical GPA is used as a predictor of future academic performance.

Although the study did not undertake to assess the efficacy of a specific method of adjusting GPAs, the following suggestion is offered. It may be possible for medical schools to group applicants by the selectivity of the undergraduate institution they attended and then to calculate the magnitude of the observed premedical GPA mean difference among college groups. If this procedure is repeated for a number of entering classes and if relatively stable results occur, it would then be possible to adjust the GPA toward a common "mean" based on group membership. For example, an admissions committee could add points to a GPA that is "deflated" but earned at a school in the most competitive category or subtract points from an "inflated" GPA earned at a competitive school. Or more simply, it may be reasonable to add or multiply the GPA by some constant based on group (college category) membership. However, in this instance, it is extremely important that the differences in premedical GPA be accurately assessed in each school's applicant pool so that the benefit of the derived constant is neither too large nor too small and is relative to the GPA differences observed between the groups (especially when there are more than two groups involved).

This study also demonstrated that knowledge of the selectivity of an undergraduate institution does not yield consistent results in distinguishing among accepted students on various predictor variables. Although the contribution of possible specific factors was not addressed in this study, the disparate results of the MCAT (no significant differences) and GPA (significant differences) analyses appear to indicate that premedical GPA may, in fact, be susceptible to extraneous factors that erroneously point to differences in academic abilities of accepted students. As stated earlier, various hypothesized influences may include grade inflation, disparate grading procedures, different standards, and different graders. Consequently, it should be obvious to the admissions officer that direct use of college selectivity as a molar predictor of academic achievement is a tenuous proposition at best.

Finally, it is important to note a possible limitation of the research presented here. It is possible that the lack of significance on the medical school variables was attributable to either a homogeneous grading system, the similarity of the subjects in terms of their academic abilities, or a combination of these two factors. For example, it may be argued that the teaching and grading practices in medical school result in the production of medical students who achieve relatively equal measured levels of mastery. Or it may be said that since all the subjects were relatively equal in academic ability to begin with (as evidenced by similar scores on the MCAT and their acceptance into medical school), the absence of differential performance in medical school and on the NBME examinations comes as no surprise. However, although both of these concerns may be true, they in no way negate the basic point of the study. That is, if premedical GPA is considered only in its raw form, it might be erroneously concluded that differences in academic ability do exist among students upon entrance into medical school and may be expected to continue in their undergraduate medical performance. In fact, among accepted students such differences probably do not exist but appear to be due to the susceptibility of the GPA measure to extraneous sources of variation.

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Development and Validation of a Test Instrument For Assessing Value Preferences in Medical Ethics

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Abstract—A test instrument for assessing the preferences medical students display for six value categories—aesthetic, economic, political, religious, social, and theoretical—was developed using a case study approach. The major validation procedures involved the relationship of medical ethics values to general values and the differences of medical ethics values as expressed by six "known groups" of non-medical students. Data from 151 medical students and 274 students representing six groups were analyzed to provide information concerning social desirability, internal consistency, and test-retest reliability. The dominance of the social value category was supportive of research previously reported that physicians consider the social dimension of medical decision-making to be of primary importance. However, because of the dominance of the social value category with all respondents and the weak known group relationships, further study is recommended to define the components of the social value category within the medical ethics domain.

Rapidly expanding technology and pluralistic societal values have contributed largely to the proliferation of new ethical dilemmas in medicine. A newly emerging realization of the importance of ethics in medical decision-making has been reflected in the concern of today's medical schools. The concern has been evidenced by a steady increase over the past decade in the teaching of medical ethics, both in medical schools and universities. A survey in 1974 found 94 out of 107 medical schools that reported some specific form of medical ethics teaching. By comparison with 1972, 17 out of 95 schools had offerings in a special ethics category (1). The relative infancy of medical ethics teaching may explain the paucity of tools to evaluate these new teaching efforts.

Because the teaching of medical ethics is fast becoming part of the curriculum of many medical schools, an instrument that can aid in the evaluation of medical ethics curricula would appear to be useful. It might also prove helpful as an aid for values clarification, as a tool for counselors in career planning, and in research projects designed to measure the effectiveness of different teaching programs during medical school.

Moral values have been studied by philosophers for centuries. Yet there is no unified approach to a theory of values nor a single definition. Allport's definition of values seems to be most closely related to

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this study: "Personal values are the dominating force in life, and all of a person's activity is directed toward realization of his values." (2)

A MEDLINE and Educational Resource Information Center (ERIC) search of the literature identified only a few instruments and studies that related to the topic of how medical students or physicians solve ethical dilemmas. Crane's study (3) of physicians' attitudes toward critically ill patients presents evidence in support of the thesis that physicians evaluate terminally ill patients not only in terms of the physiological aspects of illness but also in terms of the ability of the patient to interact socially with others. The social dimension in medical decision-making was viewed as a determining factor in whether a physician will actively treat a critically ill patient. A few studies have applied Lawrence Kohlberg's moral development theory to investigate the level of moral judgment that physicians and medical students use in arriving at a moral decision (4, 5). Consideration of moral reasoning as the sole component of moral judgment may be an oversimplification of a complex process. Typically, in moral judgment research, no assessment is made of other values that may be relevant to an individual in a given situation (6).

There would appear to be a need for the development of valid and reliable instruments to evaluate value preferences in medical ethics objectively. The present study is concerned with the construction and validation of a medical ethics inventory that will provide profiles of the value preferences of medical students regarding a sample of bioethical dilemmas.

Instrument Development

The medical ethics inventory (MEI) was constructed by the authors at the State University of New York at Buffalo. The instrument was constructed upon the theoretical framework of values as described by Spranger in his book, *Types of Men: The Psychology of Ethics and Personality* (7). Spranger's theoretical framework of values is composed of six basic categories: aesthetic—interest in form and harmony; economic—interest in the useful and practical; political—interest in power, control, legality; religious—interest in unity and comprehension of the cosmos; social—interest in human relations; theoretical—interest in discovery of truth and knowledge.

The MEI was further based upon a conceptual model that categorized ethical problems as those that involve one or more of four moral themes: respect for human life, for individual freedom, for faithfulness in covenant relationships, and for equality (8). These themes were thought to be appropriate for use as a basis for categorizing medical ethics problems, because they represent an inclusive categorical system for almost all medical ethics problems.

A pilot study was conducted as a preliminary step in the formation of the MEI. Case studies as reported in medical journals and textbooks were used to compile a set of problems that were employed in an open-response test administered to a sample of 135 university students taking a course in medical ethics at McMaster University. Inspection of the responses supplied by respondents confirmed that Spranger's six categories were highly relevant. Several problems were found to be unsuitable for inclusion in the final instrument, because the range of responses was very limited. The final set consisted of 12 dilemmas. Six response choices similar to those which were supplied by respondents in the pilot study and which conformed to the Spranger value definitions were included for each dilemma. Six "judges" were chosen on the basis of their education and experience to represent each of the six value categories. It was presumed that each judge would score highest on the value category that the judge was chosen to represent. Scores from the six value subscales were used to form a value profile. The judges' value profiles were as predicted. For example, a social worker was found to have a predominant social profile. The judges also matched responses with definitions that represent the value categories. As a result of the judges' responses and comments, certain choices were altered to conform more closely to their suggestions.

The MEI consists of 12 medical ethics dilemmas, for which there are no right or wrong answers. Respondents are asked to rate all six value statements according to a five-point scale of importance. The MEI contains six subscales (each with 12 items) that correspond to the six values conceived by Spranger. Subscale scores were formed by summing responses to individual items; this created a range of possible scores for each subscale from 12 (low importance) to 60 (high importance). A sample problem* from the MEI follows:

> A concerned mother went to her family physician with her 14-year-old retarded daughter. The woman was upset to find out that her daughter had been sexually active with several boys at her special school. The mother wanted the child to be sterilized before pregnancy occurred. She was a widow who had three other children and told the doctor that she could not cope with raising any more children. If you were the family physician, how would you rate the following six choices in terms of importance to you for decision-making? (The ratings range from A, not at all important, to E, extremely important.)
>
> 1. The feelings and well-being of the daughter and the mother (social value category).
> 2. The medical history of the patient and the advantages and disadvantages of sterilization (theoretical).
> 3. The physician's responsibilities in view of the legality of performing the sterilization (political).
> 4. The projected costs versus benefits of the various options, for example, maintaining the offspring, performing future abortions (economic).
> 5. The procedure might be in conflict with a spiritual ideology (religious).
> 6. The child of a retarded mother would have a different style of life than of a normal mother (aesthetic).

Hypotheses

In order to establish construct validity for the MEI, two research hypotheses were formulated. One concerned the relationship of medical ethics values to general values, and the second one considered the differences of medical ethics values as expressed by six known groups of non-medical students.

Spranger's theories suggest that individuals rank order values as determined by a variety of mental (inner) complexities and life (outer) situations. He suggests that different inner and outer situations contribute to differing value systems. This would imply that values expressed in a specific context such as medical ethics may differ from values in a general context. Thus a major hypothesis for establishing the empirical validity of the MEI can be stated as: there is a relationship between general values and medical ethics values.

The Study of Values (SOV), developed by Allport, Vernon, and Lindzey (9), is based upon the six value categories suggested by Spranger. Because the SOV samples items from a variety of contextual settings, it produces value profiles of a "general" nature Reliability and validity data in the test manual appear to be adequate for test purposes. The data for claims of validity and reliability cited in the 1970 manual are based on data collected in the 1950s. The 1970 revised edition updates the responses and supplies more contemporary examples. The theories of Spranger and the SOV instrument were selected as the basis for investigation of the construct validity of the MEI. Since both instruments (SOV and MEI) share the same six value categories, they should display similar factor structures (patterns). Differences should also be evident based upon the differences between general values and medical ethics values.

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* The entire instrument is available from the authors.

The modified form of the SOV used for the study reported here contained 15 items. Each value factor was represented by 10 responses. A rank order response format was used with the greatest preference being scored as 1 and the least as 4. A sample item from the modified SOV follows:

> When you go to the theatre, do you as a rule enjoy most: (*a*) plays that treat the lives of great men (political value category), (*b*) ballet or similar imaginative performances (aesthetic), (*c*) plays that have a theme of human suffering and love (social), (*d*) problem plays that argue constantly for some point of view (theoretical)?

Some investigators (9, 10) have theorized that persons in specific occupations have unique personality traits. Extensive research by Allport, Vernon, and Lindzey has shown that certain "known groups" produce predominant value profiles when administered the SOV. For example, clergymen have predominant religious and social value profiles, and medical students have predominant theoretical-political profiles. Based upon the research employing the SOV and the fact that the MEI is modeled upon the same six values, one might expect to find known groups displaying predominant value profiles when given the MEI. Such evidence would provide further construct validity for the MEI. Therefore, the second major hypothesis to be investigated is: there are differences between medical ethics values expressed by six known groups of non-medical students.

In addition to the two hypotheses, reliability, internal consistency, and social desirability for the MEI will be discussed.

Data Collection

Data were collected anonymously from four different groups of students. The first sample was 151 medical students from three medical schools (92 males and 59 females); they completed the MEI and the modified SOV. The medical school sample consisted of: 75 first-year medical students from McMaster University School of Medicine in Hamilton, Ontario; 16 first-year medical students from the State University of New York (SUNY) at Buffalo School of Medicine; and 60 second-, third-, and fourth-year students from University of Illinois Rockford School of Medicine, Rockford, Illinois.

The second sample consisted of 274 students from six known groups. There were 56 first-year law students and 41 commercial art students from SUNY at Buffalo; 39 students from McMaster University Baptist College; and 45 social work students, 33 chemical engineering students, and 60 commerce students from McMaster University.

The third sample was 90 first-year McMaster University psychology students, who took a test and a retest (after three weeks) of the MEI.

The fourth sample was a group of 80 McMaster University undergraduate students who were in a medical ethics class. They responded to the inventory and to Crowne and Marlowe's Social Desirability Scale (11).

Testing of all four samples was done in the fall of 1979, and responses were placed on machine-scoring answer sheets along with such biographical information as age, sex, religion, and university major. All students who participated in the testing devised anonymous identification numbers so that test-retest data could be matched and missing data collected. The instructions were self-explanatory, and approximately one hour was required for the respondents to complete all the test materials.

Results

Analyses failed to show significant differences in the means of the three samples of medical students. Therefore, the combined data from 151 medical students were used to compute histograms. These showed that normal distributions existed for each of the six categories of the MEI. A directional analysis was used based upon the inference that the MEI would correlate positively with the SOV, since both instruments share the same six values.

Inspection of the estimated means and standard deviations for the four sets of data indicated that a model to test the hypotheses that assumed equal variances and unequal means would be valid. All relationships were considered significant if the statistical tests used had a probability below the .05 level.

To test the first hypothesis, a canonical correlation analysis was performed. The canonical correlation analysis program, part of SUNY-Buffalo's Multiple Analysis Program System for Behavioral Science Research (12), was used. The combined data from 151 medical students are summarized in Table 1.

It can be noted from the table that the first pair of canonical variates had a statistically significant canonical correlation ($p < .01$). This accounted for approximately 38 percent of the variance that provided evidence for the existence of a relationship between medical ethics values and general values. The nature of the relationship can be inferred from a comparison of the variate structures of the two sets of variables in the canonical correlation analysis. It can be seen from the data in Table 2 that variate one in both sets is a bipolar factor between the economic and religious categories.

The other variates exhibited varied patterns that were not statistically significant. The first bipolar factor of the MEI and the SOV accounted for approximately 28 percent of the variance. It would seem from the data that the two instruments are related in some ways. Alternatively, differences exhibited between the two instruments may be due to specific values measured in different contextual situations. The medical ethics inventory when correlated with the SOV had a total redundancy of 8.6 percent, while the SOV correlated with the MEI showed 14.3 percent redundancy. (Cooley and Lohnes [13] define redundancy as used in this study.) These

TABLE 1

Estimated Proportion of Variance Extracted, Degrees of Freedom, Probability, and Chi-Square Test of Association for Six Canonical Variates of the Medical Ethics Inventory (MEI) and Study of Values (SOV) for 151 Medical Students at Three Schools

Roots Removed	Canonical R	R^2	Chi-Square	*df*	Probability
0	.62	.38	100.28	36	<.01
1	.37	.14	31.14	26	<.18
2	.18	.03	9.48	16	<.89
3	.16	.03	4.66	9	<.86
4	.08	.01	1.05	4	<.90
5	.03	.00	.15	1	<.70

TABLE 2

Variate Structures of 151 Medical Students for MEI and SOV

Variable	Variates					
	1	2	3	4	5	6
MEI						
Aesthetic	.010	.035	.232	.730	−.138	.626
Economic	−.433	−.232	−.585	.529	−.268	.258
Political	.121	−.529	.014	.687	.340	−.344
Religious	.778	−.217	−.223	.520	−.136	−.092
Social	.086	.654	−.129	.645	.347	.113
Theoretical	−.077	.250	.204	.706	−.459	−.425
SOV						
Aesthetic	−.370	.200	.629	−.549	−.061	−.350
Economic	−.555	−.203	−.050	.569	.413	.393
Political	−.188	−.473	.594	−.315	.533	−.070
Religious	.812	−.429	−.304	.068	−.216	−.113
Social	.593	.705	−.023	−.225	.120	.294
Theoretical	−.408	.422	.381	.380	−.184	−.575

small percentages of shared common variance indicated that the instruments differed in some ways. This difference may be attributed to the differing contextual situations inherent in the medical ethics cases. Thus, the two instruments showed a relationship to each other that can be taken as evidence for construct validity. Yet, the MEI has unique characteristics and structures that make it different from the SOV.

Further evidence revealing the nature of the relationship between the MEI and the SOV can be seen in Table 3, which displays the estimated means, standard deviations, rank, and correlations of the two instruments.

The six subscales of the MEI correlated positively with one another, whereas the six subscales of the SOV generally correlated negatively with one another. The SOV subscale intercorrelations from the present study closely match the data reported in the SOV manual (9). When the six subscales of the inventory were correlated with the same value categories of the SOV, three were found to have statistically significant positive correlations ($t_{(149)} = 1.65$, $p < .05$). These three are the economic, religious, and social subscales.

The rank order of subscales for both instruments showed some similarities. The social category was of greatest importance in both inventories. The economic and political values were viewed by respondents as least important. The aesthetic category was of moderate importance, with a rank of three for both instruments. The religious and theoretical categories were in fourth and second place for the MEI and changed to second and fourth place for the SOV. These similar ranks of the value categories for both inventories lends further support to the construct validity of the MEI. It should be noted that the previously established norms (9) for the 1951 edition of the SOV reported medical students' ranked profiles as theoretical, political, aesthetic, religious, economic, and social. This discrepancy between the earlier normed data (1951) and the data obtained in the present study may be a reflection of changes in societal values over the last three decades.

A multivariate analysis of variance procedure (14) was used to test the hypothesis that there are differences between specific medical ethics values and known groups. As noted previously, a sample of 274 subjects participated in this phase of the study,

TABLE 3

Estimated Means, Standard Deviations, Rank, and Correlations of MEI and SOV Variables for 151 Medical Students

Variable	Mean	S.D.	Rank	Correlations											
				A	E	P	R	S	T	A	E	P	R	S	T
MEI															
Aesthetic (A)	41.16†	5.1	3	1.00											
Economic (E)	32.08	5.9	6	.44	1.00										
Political (P)	35.45	5.3	5	.22	.35	1.00									
Religious (R)	39.43	6.0	4	.29	.13	.36	1.00								
Social (S)	51.17	4.8	1	.49	.16	.16	.23	1.00							
Theoretical (T)	43.63	5.7	2	.37	.24	.36	.31	.38	1.00						
SOV															
Aesthetic	25.83‡	4.0	3	−.10	.10	−.07	−.21	−.01	−.04	1.00					
Economic	22.02	4.0	5	.06	.21*	.15	−.21	−.01	.05	−.28	1.00				
Political	21.50	4.2	6	−.03	−.01	.09	−.11	−.16	−.07	−.23	.18	1.00			
Religious	26.72	5.8	2	−.01	−.14	.03	.45*	−.05	−.07	−.18	−.44	−.26	1.00		
Social	30.17	4.1	1	−.01	−.24	−.21	.21	.19*	.00	−.05	−.43	−.35	.11	1.00	
Theoretical	24.15	4.3	4	.05	.06	.01	.21	.10	.13	−.00	.04	−.07	−.50	.23	1.00

* Correlation ≥.14 is significant ($p < .05$).

† Values related to response system with maximum score 5.

‡ Values related to response system with maximum score 4.

which involved six known groups of non-medical students who completed the medical ethics inventory. The overall multivariate test for the hypothesis was significant ($F_{(30,1054)} = 4.27$, $p < .001$). The means, standard deviations, and rank of the six groups are in Table 4.

It can be seen from the data that only two of the six groups were identified by high scores on the expected corresponding value category. The religion students had statistically significant higher scores on the religious subscale than any of the other five groups ($t_{(268)} = 3.37, p < .01$), and the social work students showed statistically significant higher scores on the social subscale ($t_{(268)} = 3.83$, $p < .01$). The null hypothesis of no differences among the known groups was accepted, because the MEI was not able to differentiate between most of the groups.

The relationship showed that all six groups had very similar profiles. The social value was chosen most frequently, theoretical second (except for the religion students), political fifth, and economic last. There appears to be commonality in the way these six academic groups responded to the medical ethics problems. These results imply that there were similar perceptions in approaching medical ethical dilemmas that transcend educational background. The social factor in the MEI appeared to override individual and group values.

The dominance of the social value in the MEI led to an investigation of the presence of social desirability as a factor in the instrument that could account for the unexpected results. A sample of 80 university students taking a course in medical ethics was administered the MEI and Crowne and Marlowe's Social Desirability Scale (11). This scale purports to identify individuals who describe themselves in socially desirable terms in order to achieve the approval of others. The reported valid-

TABLE 4

Estimated Means and Standard Deviations of Six Known Groups of 274 Non-Medical Students from Three Institutions for MEI Scales

Group	Aesthetic		Economic		Political		Religious		Social		Theoretical	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Art	40.32	5.73	33.51	8.70	36.63	6.04	41.54	7.02	49.41	4.08	47.07	6.05
Commerce	39.63	5.50	30.93	6.23	36.53	6.20	38.27	4.66	47.40	4.59	44.48	5.38
Law	38.36	5.53	31.38	7.58	35.91	5.19	37.91	6.82	47.75	5.99	44.79	5.42
Religion	39.28	4.84	29.03	6.52	34.10	6.79	43.28*	7.06	46.49	6.72	38.90	5.97
Social Work	41.98	5.36	30.42	6.99	35.36	6.74	40.67	5.72	51.07*	4.71	45.31	4.84
Engineering	38.12	7.06	30.39	7.73	37.72	4.52	40.00	5.70	47.88	4.86	44.33	5.05

* Significant at .01 level.

ity and reliability for this scale seem adequate.

The correlation between the social desirability scale and the social subscale of the MEI was not significantly different from zero. Similarly, the other MEI scales did not correlate significantly with the social desirability scale. This information would indicate that the MEI is not testing social desirability, as measured by the Crowne and Marlowe scale.

A measure of internal consistency for the MEI was obtained from the combined sample of 151 medical students. Coefficient alphas for the six subscales were: aesthetic, .459; economic, .671; political, .606; religious, .566; social, .652; and theoretical, .653. These values reflected modest internal consistency considering that each scale was composed of only 12 items.

Test-retest reliability for the MEI was established using a sample of 90 first-year psychology students. Pearson product-moment correlation coefficients were computed. The test-retest scores correlated positively for each of the six subscales and exhibited adequate reliability. The following values were obtained: aesthetic, .71; economic, .74; political, .72; religious, .82; social, .70; and theoretical, .65.

Discussion

The results reported here present adequate reliability and modest internal consistency for the medical ethics inventory. The existence of a relationship between medical ethics values and general values was explored by using a canonical correlation analysis. This analysis revealed one pair of similar factors for the medical ethics inventory and the SOV. There was a generally positive correlation for each subscale of the MEI with the corresponding subscale of the SOV. Three of these correlation coefficients were statistically significant. The rank order of values for both instruments indicated similar patterns. This was also true for the sample of known groups, where there were similar ranks for the six values of the inventory. This evidence is supportive of the construct validity of the MEI.

The small percentage of shared common variance was cited as evidence for the differences between the two tests.

From the analysis of the hypothesis that known groups displayed different value profiles, one can conclude that only two groups responded with the predicted profiles (social and religious). This was not sufficient to reject the null hypothesis. The similarity in the rank orders of the six values by the known groups can be interpreted to mean that decision-making in the medical ethics domain appears not to be related to academic background. Although the concept of known groups may still be relevant in some contexts, the unanticipated findings regarding these different groups show that medical ethics decision-making may not be conceptualized as a simple function of the behavior of so-called known groups.

Conclusion

Limiting factors in this study include: the sample size and selection, problem selection, validation procedures, and the general problems involved in the use of self-report instruments. These limitations may have contributed to the findings and conclusions. Variance between seemingly divergent known groups was not obtained; therefore, detecting any statistically significant within-group variance would appear to be unlikely. The results presented here tend to confirm those reported by Crane (3) that physicians consider the social dimension of medical decision-making to be of primary importance. Using a sample of students from various educational settings, the present investigators found that all respondents consider the social value factor the most important. Further research is needed to represent the components of the social dimension of medical ethical decision-making and to proceed with the development of instruments in the area of medical ethics.

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Nurses in Medical School

Debra Gussman

Abstract—Each year more nurses are accepted into medical school. They bring a unique background and an already established philosophy of patient care. Thirty-three nurses currently enrolled in medical school completed questionnaires that focused on their motivation for a career change and their projected specialty preference. Most nurse-medical students were motivated for a career change because of a desire for increased patient responsibility. Most students expressed interest in primary care specialties. There was a close association between employment experience as a nurse and projected specialty preference as a doctor.

Medical students have been the subjects of many studies. A small subset of medical students, however, has escaped close scrutiny. They are nurses who have opted to expand their education and the scope of their practice by matriculating in medical school. They bring to medical school an educational background different from that of most of their classmates and an already established philosophy of patient care.

A questionnaire was designed to gather information about such students' original decisions to study nursing and their subsequent decision to pursue a medical career. Information was also collected concerning their work experiences in nursing and their projected specialty preferences.

Methods and Data

In 1980 the author sent letters to student affairs offices at 20 medical schools selected randomly requesting assistance in the form of posted notices in an effort to make contact with nurses enrolled in medical school. Students interested in participating contacted the author for a questionnaire. These students provided the names of additional nurse-medical students. Eventually the names of 43 nurse-medical students were obtained, and they were mailed open-ended questionnaires. Limited assumptions can be made concerning the representativeness of this sample.

Biographical and attitudinal information was requested. The subjects were all graduates of nursing school and had obtained registered nurse or licensed practical nurse certification before entering medical school. The questionnaire was completed by 33 of the nurses. The unusually high response rate apparently reflected the subjects' interest in this study. The information was analyzed as to content and was grouped by response. A nurse-medical student often made several different statements in answering a question, and not all questions were answered by all subjects.

Students from 18 schools responded. There were two male and 31 female respondents. The average age of the nurse-

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medical student was 28.4 years. Ten were freshmen, eight were sophomores, four were juniors, and 11 were seniors. All 33 students had undergraduate degrees; 23 had a bachelor of science in nursing, seven a bachelor of science degree, and five a bachelor of arts degree. Two students had two undergraduate degrees. Nine had pursued advanced education; five had a master's degree in nursing, and four had nurse practitioner certification.

Questions and Findings

Eleven respondents chose nursing out of a desire to help people. Eleven included among their reasons for becoming a nurse an interest in biology, science, or health. Nine became nurses because they felt that women who wanted health careers went into nursing while men went into medicine. Seven chose it as a marketable skill. Six saw nursing as an inexpensive educational opportunity. Four mentioned a close personal experience with illness as a motivating factor. Five had nursing thrust upon them by family expectations. Three discussed favorable role models. One chose nursing in case she did not get into medical school. One was influenced by the children's novels about nurse Cherry Ames, and one wanted to become a midwife.

Twenty-six nurse-medical students were motivated to enter medicine for reasons that centered on a desire for responsibility. Of these, 12 wanted responsibility for patients and control of patient care. Ten discussed medicine as a route to having autonomy and independence of practice. Four desired control, power, and influence over the health care team.

Seventeen students wanted medical knowledge. They wanted to learn about pathology and physiology. Of these, four stated they wanted to learn "how to diagnose and treat." One wanted to learn how to operate.

Sixteen indicated that motivations were tied to issues of status and personal challenge. Six wanted more recognition and felt that a medical education would increase their status in the eyes of others. One student applied to medical school because of the boost it would give her self-esteem if she were accepted. Nine nurse-medical students felt medicine represented a challenge they wanted to meet.

Thirteen nurse-medical students expressed a desire to help people as a reason for wanting a medical career. Four wanted to be better patient educators, five wanted increased earning power, and one wanted research opportunities.

When asked about their primary area of interest, the breakdown of medical specialty preference was as follows: family practice, 8; internal medicine, 7; obstetrics and gynecology, 6; surgery, 3; pediatrics, 3; psychiatry, 3; emergency medicine, 2; and critical care, 1. Several students listed other possibilities in addition to their primary choice. Pathology, radiology, and academic medicine were considered by one student each. There was a 70 percent association between work experience as a nurse and primary career choice as a physician.

Discussion

In the past several years the number of nurses applying to medical school has been steadily increasing (Table 1). A sample of nurses who are currently enrolled in medical school was polled. Attention was focused on the following topics: initial interest in nursing, desire for a career change to medicine, and projected career goals.

Most nurse-medical students chose nursing for conventional reasons. These reasons included a desire to help people, an interest in science, a desire for a marketable skill, and personal and family expectations and experiences. These motivations closely paralleled those motiva-

TABLE 1

Nurse Applicants to Medical School, 1975–76 to 1979–80

Nurse Applicants	1975–76	1976–77	1977–78	1978–79	1979–80
Number	206	215	239	256	271
Percent of applicant pool	.4	.5	.6	.7	.7
Number accepted	48	63	77	90	104
Percent of nurse applicants accepted	23.3	29.3	32.2	35.2	38.4

Source: Annual editions of *Medical School Admission Requirements*, published by the Association of American Medical Colleges.

tions of nursing students described by Smith (1) and by Morris and Grassi-Russo (2). In this age of women's liberation, it was surprising to find that 27 percent of the nurse-medical students chose nursing for the traditional reason that women interested in a health career pursued a career in nursing and that men with similar interests followed a path to medicine.

The nurse-medical students gave more than 20 different reasons for wanting to study medicine. Their responses could be grouped into four main categories: a desire to control patient care, an opportunity to obtain medical knowledge, a desire to help people, and a desire to achieve status in the community or to increase self-esteem. These motivations were similar to those presented by freshman medical students described by McDermott (3) and the motivations of female medical students by Cartwright (4). They were also similar to the reasons the same students originally chose nursing, with one exception: the desire to control patient care and to guide the direction of the health care team. It is ironic that the issue of autonomy should surface in a time of increasing regulation of medical practice. The scope of practice is now influenced by hospital administration, government agencies, insurance companies, and precedents set in malpractice litigation. There is also increasing regulation from within the medical community by peer review groups. The focus on independence in practice may serve as a source of future disillusionment for this group of medical students.

Historically, women in medicine have selected specialties such as pediatrics and psychiatry. They have been poorly represented in surgery and the surgical subspecialties. Braslow and Heins (5) divided the female resident pool by specialty training. Internal medicine had the largest proportion of women with 24.3 percent. Surgery and surgical subspecialties attracted 9.1 percent. Psychiatry was second with 11.7 percent. The nurse-medical students showed interest in these three areas in similar proportions, with 21 percent being interested in internal medicine, 9 percent interested in surgery, and 9 percent interested in psychiatry. However, there were several specialty preferences among the nurse-medical students that were markedly different from the distribution of female residents. The most common career choice among the nurse-medical students was family medicine, with 24 percent of the students describing it as their primary career choice. This is in contrast to only 8 percent of the female resident pool. Another area is obstetrics and gynecology, where 18 percent of the nurse-medical students expressed interest as compared with 9.4 percent of the female residents. The nurse-medical students did not show much interest in one area of medicine that has traditionally attracted female doctors: 20.1 percent of female residents were in pediatrics, but only 9 percent of the nurse-medical students described pediatrics as their primary choice.

There was a notable lack of interest by nurse-medical students in areas such as clinical pathology, radiology, and anesthesiology, areas that involve 16.6 percent of the female residents. The nurse-medical students may not have considered these options for several reasons. Many of the students who participated in this study had not reached the fourth year when electives in these areas are offered. Also, these students indicated a preference for direct patient care. The specialties mentioned, although very important for patient care, are more geared toward physician consultation rather than direct patient needs. A third factor was the lack of nursing equivalent for pathology, anesthesiology, and radiology. Nurse-medical students were attracted to areas in which they had had experience as nurses.

The group was predominantly interested in clinical practice. Seventy-three percent of the nurse-medical students expressed interest in areas traditionally associated with primary care. Only one student mentioned academic medicine as a career possibility. This may also be a reflection of the strong association between work experience as a nurse and projected career expectations.

Admission committees should consider the possible advantages of recruiting nurses into medicine. Nurses have experience in applying scientific knowledge to patient care. They bring a "care" oriented background to the "cure" oriented traditions of medicine. They have indicated a strong commitment to patient care. A follow-up study should be done on the nurse-medical students' career choices. If the association with nursing experience persists or if primary care areas dominate their career selection, they might provide one means of rectifying the manpower maldistribution of medical specialties.

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A Required Course in Decision-Making For Preclinical Medical Students

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Abstract—Objectives, methods of instruction, and evaluation of a preclinical course in decision-making are described in this article. One set of objectives that related to learning to read and write clinical algorithms was taught by having students read a clinical algorithm about a problem, solve a patient management problem about the problem, and write an algorithm. A second set of objectives that related to learning clinical decision analysis was taught by solving problems and discussing them. Three methods used to evaluate three classes showed the following results: large increases in taped interview problem (TIP) scores after learning algorithms, high mean scores on a final examination that tested all course objectives, and high voluntary class attendance. It is concluded that preclinical medical students can be taught cognitive decision-making skills, that the TIP is a promising tool for measuring such skills, and that careful monitoring of a course in clinical decision-making may provide valuable information regarding learning and teaching clinical management.

Medical decision-making has traditionally been taught mainly in the clinical years, either at the bedside or in case-oriented seminars. In many schools a preliminary approach to decision-making is taught in seminars that begin in the preclinical years and that attempt to correlate basic science principles with clinical phenomena (1). Almost always, however, such preclinical seminars aim to teach clinical data evaluation and principles of differential diagnosis rather than diagnostic and therapeutic decision-making. Principles of decision-making are generally taught in an elective course, if at all.

The field of medical decision-making has two main directions. First, Ledley and Lusted (2) pioneered the application of mathematical decision theory to medical problems. This approach, which may be termed clinical decision analysis, has been described in a textbook by Weinstein and colleagues (3), and its applications to health care have been reviewed by Krischer (4). Second, Tuddenham (5) and the editors of the journal, *Patient Care*, began to construct clinical algorithms (flow charts) for guiding patient management. Use of medical algorithms has been reviewed by Feinstein (6) and has led to widespread use of algorithm-based protocols by paramedical and medical person-

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nel to guide and audit care of specific medical problems (7). The course described here was aimed at teaching both principles of clinical decision analysis and algorithmic analysis of clinical decisions.

The curriculum at the Faculty of Health Sciences of the Ben-Gurion University of the Negev in Israel differs from traditional curricula in that all curriculum content is introduced at several points during the six-year course of studies, each time at a higher level of sophistication (8). Clinical work, for example, starts during the first week of the first year with a course on the natural history of disease that begins with the practice of interviewing and simple physical examination skills in the hospital, in the clinic, and in the patient's home.

The authors decided to apply the principle of early introduction of curriculum content to the area of medical decision-making. They sought and gained faculty support for a required eight-session course in medical decision-making to be given during the third and last preclinical year (roughly equivalent to the second year in an American medical school). This paper describes the course and its evaluation during the first three years that it was given (1977–1979).

Goals and Objectives

The goals of the course were to teach preclinical medical students to construct and use clinical algorithms and to apply principles of clinical decision analysis. Specific objectives were as follows:

Algorithm objectives—At the end of the course, the student was expected to identify the effects of the environment, information, the patient, and the physician on a medical decision; read clinical algorithms; construct a clinical algorithm to solve a problem not learned in the course; and show a significant increase in knowledge of how to manage a set of medical problems in one clinical area (for example, neonatology).

Decision analysis objectives—At the end of the course, the student was expected to define the following concepts used in decision theory and solve problems using these concepts: probability; the decision process, including objectives, state, action and outcome variables, consequences and value functions; risk and risk aversion; values, utilities, and costs, including expected values; decisions under conditions of certainty, risk, and uncertainty; dominance; estimating probabilities, including subjective measures and estimating utilities; value of information; and decisions that relate to individual patients versus decisions that relate to the public.

Instructional Methods

Bruner (9) has observed that a method of instruction must be suited to the nature of the subject. It follows that a method that will enable the preclinical medical student to learn how to make clinical decisions must allow him to practice making clinical decisions. On the one hand, the student must make specific medical decisions, since the processes of medical problem-solving and decision-making are dependent on problem or decision content (10). However, he must make a variety of decisions in order to learn general principles of decision-making. The following instructional methods, all of which enabled the student to practice making clinical decisions, were used in this course.

Algorithm learning—For the first half session (one hour), students toured the newborn unit. The tour sought to define concretely for the student such unfamiliar terms as "bilirubin light" or "oxygen analyzer" by demonstrating diagnostic and therapeutic maneuvers employed while caring for newborns. Then, during the first hour of three two-hour sessions, algorithms in neonatology were read, at first together with a clinical instructor and then alone by the student, who used the instructor as a consultant. During the second hour of these three sessions, the student solved a newborn management problem (NMP), which simulated a patient with the same problem, and compared his solution with that of the neonatologist (11).

An NMP is a type of patient management problem that allows the student to choose any diagnostic or therapeutic maneuver in any order (11). NMPs are based on Helfer's (12) diagnostic management problems. NMPs differ from traditional patient management problems in that they do not limit the student's choice to categories (for example, history, physical examination, laboratory tests), and they enable the student to record the sequence of choices within a category.

During the fourth session (two hours) students constructed an algorithm to solve a problem of their choice in an area of practice other than neonatology.

For the third class taking the course, the first of three clinical algorithms and matching management problems dealt with a primary care rather than a newborn problem. This change was instituted because success of the first two classes at learning NMP content caused students, instructors, and other faculty members to suggest that at the Ben-Gurion school, which has a special goal of training primary care physicians, at least some of the course should be taught in the context of primary care.

Decision analysis problem-solving—Concepts were presented in printed notes with examples that were handed out before class and then discussed. No attempt was made to present theoretical notions of preference relationship or other aspects of the mathematical justification and proof of various statements. At times the students themselves raised some of these issues and were referred to appropriate literature and/or discussion after class. Such detail was avoided because of the limited mathematical background of many students.

Evaluation Methods

Student achievement and course success were evaluated by three methods.

Taped interview problems—Before and after most of the algorithm-NMP learning sessions, the class was tested using the same taped interview problem (TIP) which assessed knowledge of how to manage the problem learned in the algorithm. The form of the TIP was suggested by the clinical problems that are frequently posed orally to students by expert clinicians in order to test the student's clinical acumen. A TIP is a series of taped clinical vignettes, all related to a single clinical problem and followed by the question, "What would you do?" Taped presentation of a developing patient problem prevents cueing the student to answers from information supplied at earlier stages of the problem. The student is asked not to erase answers he has already finished (13). In order to test long-term retention, the asphyxia TIP was administered again, without warning, at the end of the newborn rotation week of the pediatric clerkship, one year after the end of the course.

Written examination—A written examination consisted of seven open-ended questions, five on clinical algorithms (50 points) and two on decision analysis (50 points). Of the first five questions, two were case problems taken from the asphyxia and normal newborn TIPs that required solutions contained in the algorithms learned in class; one was a new jaundice case problem that required a diagnostic decision learned in class; one required the student to list the four factors (physician, patient, knowledge, environment) influencing the decision in the jaundice question; the last question required the student to construct his own algorithm for a child presenting with red urine, a history of impetigo, and facial puffiness. The first decision analysis question required the student to analyze formally a decision regarding a patient with pharyngitis and fever, to construct a value table for the possible outcomes, and to indicate which decision should be preferred using criteria for decision-making in conditions of uncertainty. The second question asked the student to decide, assuming specified conditions and costs, whether it was worth sending a throat culture for every patient presenting with sore throat.

Class attendance—Since class attendance was optional (as it is for all nonclinical courses), it was used to estimate nonobtrusively (14) course acceptability.

Evaluation Results

Pretest and posttest results are given in Table 1 for four TIPs given to class 1, three of which were also given to class 2 and one of which was given to class 3. There were large gains for all problems in all three classes. The fact that standard deviations are large is probably due to relatively high scores of experienced medical corpsman and students who had worked as nurses in each group. Mean score on the asphyxia posttest increased 143 percent when compared with the pretest. When repeated one year later it had increased only another 18.5 percent, from a mean of 58.5 (S.D., 22.3) to a mean of 69.3 (S.D., 10.2).

Results of the written examination are shown in Table 2. The examination was administered to class 1 in the middle and at the end of the course and to classes 2 and 3 at the end of the course. At the end of the class 1, class 2, and class 3 courses, tudents achieved average scores of 65.6, 57.2, and 48.5 percent respectively. For all

TABLE 1

Pretest and Posttest Results* for Four Taped Interview Problems Presented to Three Consecutive Medical Classes, Ben-Gurion University, 1977–1979

Class	Normal Newborn					Asphyxia					Seizures					Jaundice				
	No.	Pretest		Posttest		No.	Pretest		Posttest		No.	Pretest		Posttest		No.	Pretest		Posttest	
		Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.
1	27	56.52	24.77	74.0	29.8	28	24.1	15.0	58.5	22.3	29	14	13.7	61	24.7	23	10.7	5.78	21.0	8.0
2	30	41.47	26.20	69.68	20.7	26	33.5	17.9	64.81	14.4	24	7	8.2	63.03	24.06					
3	27	33.04	16.63	68.57	17.4															
Total	84	44.85	23.10	71.07	24.01	54	28.1	16.26	60.09	19.6	53	11.28	11.8	61.7	24.4					

* Maximum grade = 100.

TABLE 2

Written Examination Results for Three Consecutive Medical Classes, 1977–1979

Class	No.	Algorithm Questions*		Decision Analysis†		Whole Examination‡	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1977–mid course	30	36.9	7.3	32.6	11.5	69.5	15.1
1977–end course	30	36.83	5.74	29.16	14.01	65.6	17.7
1978–end course	28	33.8	9.51	26.62	13.23	57.16	21.3
1979–end course	33	25.6	5.65	22.9	9.89	48.5	12
Total§	91	31.8	7.08	27.03	12.4	56.8	17.2

* Maximum = 50 percent.
† Maximum = 50 percent.
‡ Maximum = 100 percent.
§ Refers to end-course results only.

three examinations, this score was the result of roughly equal achievement for the algorithm and decision analysis halves of the examination. In addition, scores on specific questions showed roughly equivalent achievement on all of the questions. Class 3 scores on all questions were lower than for the previous two classes.

Two-thirds of the class generally attended the algorithm sessions (range, 60 to 100 percent; mode, 70 percent), which compared favorably with attendance in other courses. Students were always alert and involved in reading algorithms and doing NMPs. However, only a small group of more mathematically oriented students seemed involved in the decision analysis sessions, and attendance after the first session was less than 40 percent.

Discussion

The main purpose of this paper is to demonstrate that medical decision-making can be taught successfully to preclinical medical students. Although evaluation data are presented, due to variations in class attendance, TIP data are incomplete. However, these data are not to be viewed as the results of a scientific experiment but rather as the results of a methodical evaluation of student achievement and as an indicator of course success.

An explanation of the term "decision-making" is in order. Originally, the course was called "clinical judgment." However, clinical judgment implies a consideration of the general medical problem-solving process as elucidated by Elstein (10) and Barrows (15), as well as a consideration of work on the relationship of medical knowledge to problem-solving (16). Some of these concepts were referred to; but since they did not constitute course objectives, the course name was changed to "medical decision-making," which seems to describe course content more accurately. This new, more restrictive definition, however, also made the authors realize that psychosocial aspects of decision-making (17) had not been covered in the course. These aspects were to be discussed in the 1981–82 course.

Although algorithms have been repeatedly criticized for encouraging rigid thinking, learning to use algorithms constitutes a major part of the course. An exhaustive discussion of this criticism would be inappropriate here. However, the authors feel strongly that work with nonmedical algorithms (18), as well as experience with algorithm learning by paramedics and physicians, shows that algorithms help students both to define their thinking more clearly and to prevent clinical errors. Algorithms probably increase rather than decrease flexible thinking.

From the large increases observed in TIP posttests as compared with pretests and from the high final examination scores on questions 1, 2, and 4, it was concluded that preclinical medical students learned from algorithm-NMP sessions to manage a variety of newborn problems. These results are consistent with results of a pilot study carried out with third-year clinical clerks in the United States (13). However, it cannot be concluded from the results here either that management skills will be used outside the classroom (that is, that clinical performance is improved) or that another more traditional method of learning, such as from a text, a lecture, a case presentation, or from bedside rounds, is any less effective. Algorithms have been shown to be superior to text that describes nonmedical decisions (18). A controlled trial is, therefore, in progress, using TIPs as the dependent variable that will compare algorithms and matching NMPs with text.

Another question that cannot be answered using present data is to what extent learning to manage one newborn problem improves skill at managing a different newborn problem or another pediatric problem. Although medical management skill has been described as being largely problem-specific (10), the authors hypothesize, as others have, that within a specific clinical area (for example, newborn, adolescent, cardiology), learning to manage a problem will to some extent improve management of another problem. This hypothesis could be tested by an experiment that would vary the sequence in which algorithms matched with NMPs are learned within and between clinical areas and would test for differences using TIPs.

The persistent high mean score on the asphyxia problem is evidence that knowledge of managing newborn asphyxia taught with algorithms and NMPs may be retained for a long period. Sharp tapering of the increase in the asphyxia TIP score after a newborn clerkship that purported to teach about asphyxia may be explained either by ineffective teaching during the clerkship or by teaching that did not add to what was taught in the medical decision-making course. Retention of learning from algorithms and NMPs should be tested for other problems and compared with other teaching methods, since longer retention might be an important advantage of learning with algorithms and NMPs.

Final examination questions on factors influencing a medical decision, writing a new algorithm, value analysis, and cost analysis were not pretested. However, in view of the fact that the subject matter required to answer these questions is not taught in any prior course and in view of the almost total ignorance of the subject demonstrated initially by the students in class, it seems likely that classes 1 and 2 were successful in learning the concepts tested.

Lower grades for class 3 were probably due to the following changes in the instructional method. First, since the tour of the newborn unit was dropped because of lack of time, the introduction to strange terminology was limited. Second, learning about newborn problems was diluted by learning about primary care problems. Third, discussions about decision analysis were curtailed because of lack of time.

The data support three conclusions. First, preclinical medical students can be taught cognitive clinical decision-making skills using clinical algorithms and matching NMPs; they can be taught to write algorithms; and they can learn clinical decision analysis. Second, the TIP shows promise as a simple, cheap measure of cognitive management skill, and its reliability and validity should be determined. Third, careful monitoring of a course in clinical decision-making may provide information and stimulate hypotheses regarding learning and teaching medical decision-making.

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COMMUNICATIONS

Medical Student Attendance at Lectures: Effect on Medical School Performance

Robert M. Sade, M.D., and Martha R. Stroud

In recent years failure of large numbers of medical students to attend lectures in the basic sciences during the first two years of medical school has become an important problem at the Medical University of South Carolina (MUSC) College of Medicine. Students rationalize their behavior by insisting that many faculty members are ineffective teachers who present poorly organized lectures that are uninteresting and too laden with facts. They further claim that they can best learn the required material by independent study, though there exists no formal independent study program like those in other institutions (1).

Many faculty members, on the other hand, allege that students are not sophisticated enough to be able to determine the value of information contained in lectures and that they generally underestimate the future value of the basic sciences in their medical careers. Some believe that attendance at lectures should be mandatory.

Discussion of these problems generally is driven by emotion; few data exist to judge the educational value of attending lectures. The best way to answer many of the questions raised would be with a prospective, randomized study, assigning students to a lecture attendance group or to a nonattendance group. The logistics of such assignments would be almost impossible to enforce, however, in the setting of a medical school. An attempt, therefore, has been made to collect the data that can be extracted from existing records. However, it is recognized that the retrospective nature of the study would weaken any conclusions that might be reached.

Methods

The class presidents of the 1979–80 sophomore (166 students) and junior (159 students) classes in the MUSC College of Medicine were asked to generate, in whatever manner they believed most accurate, a list of students in their classes who attended more than 95 percent of lectures (attendees) and a list of those who attended less than 5 percent of lectures (nonattendees) during their first and second years of medical school. The presidents each compiled their lists by consulting with classmates who they knew attended classes most of the time. The lists were kept confidential; the group to which each student belonged was encoded, and the code was known only to the statistician. Data collected on each student included grade-point average (GPA) in undergraduate college and the first two years of medical school, the score on the Medical College Admission Test (MCAT), and the score (for juniors only) on Part I of the examination of the National Board of Medical Examiners (NBME-I).

There were 85 attendees and 52 nonattendees in the two classes. These groups were compared in two different ways. With analysis of covariance, the GPAs in the first and second year of medical school and the scores on NBME-I, adjusted for undergraduate college GPA and for MCAT score, were compared. For two-way analysis of variance, members of the attendee group were matched with members of the nonattendee group who had a similar college GPA, thus generating 43 matched pairs of attendees and nonattendees. It was not possible to match all students because of unequal distribution of scores. The groups were also paired by MCAT scores and compared.

Results

There was no significant difference between attendees and nonattendees in mean college GPA (3.45, S.E.M., 0.03, versus 3.51, S.E.M., 0.05) or in mean MCAT scores (52, S.E.M., 1, versus 51, S.E.M., 1). Interestingly, there was poor correlation between college GPA and

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TABLE 1

Mean and Standard Error of Mean of Medical School GPA and NBME-I Scores for Medical Students Classified as Lecture Attendees and Nonattendees, Matched for Premedical College GPA and MCAT Scores, Medical University of South Carolina

Pairings	Attendees		Nonattendees		p*
	Mean	S.E.M.	Mean	S.E.M.	
College GPA					
First-year GPA	3.01	0.09	2.74	0.01	< 0.05
Second-year GPA	3.13	0.08	2.86	0.09	< 0.05
NBME-I	539	19	442	20	< 0.0005
MCAT					
First-year GPA	2.94	0.09	2.80	0.09	< 0.05
Second-year GPA	3.12	0.09	2.80	0.09	< 0.01
NBME-I	515	19	440	21	< 0.05

* Probabilities based on two-way analysis of variance for differences between medical school GPA and NBME-I scores of attendees and nonattendees.

MCAT score ($r = 0.0963$, $P > 0.05$). To rule out unequal distribution of scores between attendees and nonattendees, the shapes of distribution curves of college GPAs and MCAT scores were compared using the chi-square test of independence. In both cases, there were no significant differences of distribution between the groups.

Two-way analysis of variance of matched pairs demonstrated that attendees scored significantly higher than nonattendees in all categories (Table 1). Analysis of covariance, using college GPAs as well as MCAT scores as covariates, produced a nearly identical result.

Discussion

It is clear that students at the school who have chosen to attend lectures during the first two years of medical school perform significantly better in GPA and NBME-I than students who have chosen not to attend, even when corrections are made for premedical college performance. Interpretation of these conclusions is difficult, however, because the study was retrospective. A major confounding factor is that the students were not randomly assigned to each group; rather, they decided to attend or not to attend classes for reasons unknown to the investigators.

The greatest objection to this study, however, lies in the measures used to compare the effects of lecture attendance. In the authors' view, the purpose of a student attending medical school is not to have a high GPA or to score well on board examinations but to leave medical school with all of the intellectual and moral equipment to be an excellent physician (2). The sparse available data relating grade to later career performance suggest little correlation between them (3). Until better methods of evaluating the effect of medical education on performance appear, investigators will have to be content with the inexact predictors of professional performance that are available.

GPAs and board examinations, despite their limitations, influence the future of most students, to wit, their use by some state boards for registration purposes and by many hospitals in evaluation of house officer candidates. Medical students would do well to heed this message: under the conditions described in this study, students who performed equally in college have significantly higher GPAs and NBME-I scores in medical school, for whatever reasons, if they attend lectures regularly than if they do not.

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Divergent Pediatric CME Priorities in a Rural Area

Jerome P. Rosenthal, Ph.D., and Tim C. Miller, M.D.

Continuing medical education (CME) in general and pediatric CME in particular remain elusive in both their mandate and their implementation. Both are being addressed with increasing objectivity; however, attempts at providing pediatric CME in metropolitan communities and their adjoining rural catchment areas pose unique problems. Some of these problems have previously been identified: lack of communication between the university medical center and rural physicians, lack of coverage for solo practice physicians while attending CME programs, travel distances, variable motivation, and failure of CME courses to meet individual needs (1).

In an attempt to document the possible factors leading to these difficulties more fully, the authors conducted a survey of pediatricians in the 23-county North Central Perinatal Region in Illinois about their "perceived" continuing medical education needs. They were asked by questionnaire to rate 32 subject areas according to the importance they assigned each subject in their own continuing medical education. The subjects selected were based on a list of "subspecialty interests named by pediatricians as those they currently emphasize or would like to emphasize" that was compiled by the Committee on Manpower of the American Academy of Pediatrics (2). The rating scale was 1 to 3 with 1 being "not needed" and 3 being "needed."

The pediatricians in the region were divided into three major groups on the basis of their practice location in relationship to the University of Illinois College of Medicine Peoria School of Medicine: hospital or school-based pediatricians in Peoria; local or office-based pediatricians in Peoria; and rural pediatricians or those in the 23-county region outside of Peoria. Rural pediatricians were further defined as those who were practicing in communities more than 30 miles from the teaching center, had no local subspecialists available, and had primary affiliations with hospitals delivering fewer than 1,000 babies each year.

The numerical ratings received for each CME subject were averaged for each group of pediatricians, and comparisons were made of the importance assigned to the CME subjects within each group and of the differences in "perceived" CME needs among the groups.

In addition, the total group responses for all 32 CME subjects were again averaged to obtain the overall level of group response. The overall level reflects the degree of intensity, or interest, that each group places upon continuing medical education in its practice.

High priority topics were arbitrarily defined as those topics receiving an overall group response of 2.4 or greater. All statistical comparisons were made by using the Student's *t*-test for independent samples.

Results

Seventy-eight percent of all pediatricians surveyed responded to the questionnaire. The large response for a survey of this nature is attributable to the close working relationship of one of the authors with the pediatricians in the region afforded by an active perinatal outreach program.

The hospital/school-based pediatricians gave high priority to relatively few CME topics, such as allergy and immunology, adolescent medicine, and behavioral pediatrics, whereas the local/office-based pediatricians, in addition to the preceding topics, gave high priority to dermatology, delinquency and drug abuse, pulmonary disease, and metabolic disease. Of all these topics, only delinquency and drug abuse was given a low priority status by the rural pediatricians. In addition, 11 other topics were rated high by the rural pediatricians: infectious

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disease; learning disabilities; neonatology; accidents, poisoning, trauma; gastrointestinal disease; endocrinology; neurology; nutrition; genitourinary disease; growth and development; and musculoskeletal system.

Significant differences in perceived need were demonstrated between pediatricians practicing in a rural setting and all pediatricians practicing in a community associated with a university center. The topics which were significantly different ($p \leq 0.05$) were: cardiology, genitourinary disease, infectious disease, learning disabilities and school adjustment problems, neonatology, and pulmonary disease. All of these topics were given a greater priority by the rural pediatricians than by the other two groups. However, no significant differences were demonstrated in the ratings of these topics by the two groups of Peoria pediatricians. It was also observed that far more topics were expressed as needed by the rural pediatricians than by either group of Peoria pediatricians. Indeed, it appears that more topics were perceived as a high priority need as the distance between the pediatricians and the teaching center increased.

Discussion

The dissemination of new medical information underlies the development of any CME project. This task is even more formidable when the setting is rural.

Just as the distribution of health manpower into rural areas remains a problem in health care delivery, so does the flow of medical information to the health care teams in these same areas. This flow of information might be interrelated to the point of influencing manpower distribution. At a minimum, in order to have effective CME, the flow must be present and uninterrupted.

Continuing medical education has been defined as encompassing the following educational elements: identification of needs, learning objectives, teaching methods, and evaluation of learning outcomes. These elements have traditionally been defined at and implemented from the university and/or teaching hospital setting. Commentary on this process has already started, and to some extent the dialogue has begun to address rural educational concerns (3, 4). Miller (5) has referred to the gap between academia and the front-line troops.

As an initial step in achieving the first of these educational elements, needs-identification, in Illinois, improved communication with rural pediatricians was generated by an active perinatal outreach program in the North Central Perinatal Region. The experience of this program and of others (6, 7) has shown close communication to be an effective method of determining the educational needs of rural physicians.

The results of the present study have pointed up significant differences in perceived needs as the pediatrician's practice became more physically distant from the university/hospital teaching center. The rural pediatricians expressed an increased desire for CME in pediatric subspecialties and for those problems commonly seen in a rural office setting. It is, therefore, important that comprehensive CME programs developed on the basis of survey results, such as presented in this communication, address the expressed needs of all the groups surveyed.

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Recognition of Anxiety and Depression By Residents in a General Medicine Clinic

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Anxiety and depression are frequently found in patients presenting for medical care (1–5). In an effort to improve house staff recognition of psychosocial factors in medical care, the present investigators studied the prevalence of anxiety and depression in clinic patients, the ability of residents to identify these affects, and the accuracy of patients' responses to simple written questions about anxiety and depression.

Methods

A study population of 207 patients was drawn from 625 patients attending the University of Virginia Internal Medicine Walk-In Clinic over a five-week period. The clinic is staffed by resident physicians with faculty supervision. The overall walk-in clinic population is 51.8 percent Caucasian and 41.7 percent black. The mean age is 38.8 years. The population is 54.4 percent female. The sample population was comparable statistically with these characteristics ($p > 0.1$).

All patients presenting with a new complaint were invited to participate in the study. Patients were excluded if they: (*a*) arrived while the interviewer was with another patient; (*b*) arrived when a physician was immediately available to see them; (*c*) declined to participate; (*d*) were incapable of understanding the test questions; or (*e*) expressed current suicidal ideation.

All patients were seen by one interviewer, a third-year medical student. Interviews were conducted while the patient waited to see his physician. Physician assessment of the patient's anxiety and depression was obtained after each visit.

The SCL-90, developed by Derogatis (6), is a 90-item symptom checklist that assesses nine psychological parameters. The two subtests for anxiety and depression were combined and used as a 23-item checklist. The criteria for clinical abnormality for the SCL-90 are an adjusted score greater than 0.63 on at least two scales of the test.* Therefore, patients had to score above the cutoff point of both scales in order to be judged abnormal. In addition, patients and physicians were each asked to rate on separate 100-millimeter-line scales their assessment of the patient's level of anxiety and depression. Scores of these assessments were classified as abnormal if they were above the 50 millimeter point.

Results

Fifty-two patients scored above 0.63 on both scales for a frequency of combined anxiety and depression of 25.1 percent. Patient self-assessments and resident assessments were compared with SCL-90 results. Patient's self-assessments were more strongly associated with the SCL-90 subtest scores than were resident's assessments (chi-square = 49.71, $P < .0001$ and chi-square = 5.58, $P = 0.018$ respectively).

Patient self-assessments and physician assessments were also compared with the SCL-90 subtest results using the concepts of sensitivity and specificity (7). Patient self-assessment

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* Personal communication, L. R. Derogatis, Ph.D., associate professor of medical psychology, Johns Hopkins University School of Medicine, March 13, 1980.

alone yielded a sensitivity of 51.9 percent, and the sensitivity for resident alone assessment was 26.9 percent. When either patient or resident judged the patient abnormal, sensitivity rose to 61.5 percent. When specificity was examined, patient assessment alone yielded a value of 92.3 percent and resident assessment a value of 87.1 percent. If both patient and physicians judged the patient normal, specificity rose to 98.7 percent. Predictive values were calculated. If a patient indicated he was abnormal, 69.2 percent of the time he was correct; if he indicated he was normal, he was correct 85.1 percent of the time. Comparable figures for resident assessment were 41.2 percent and 78.0 percent. If both patient and resident agreed the patient was abnormal, they had a 81.8 percent chance of being correct; if both thought the patient normal, they were correct 86.2 percent of the time.

Discussion

The study found over 25 percent of the walk-in patients in a university medical center to be anxious and depressed. When asked to identify these patients, residents only identified 26.9 percent. When patients were asked to report their own anxiety and depression, however, their answers correctly identified 51.9 percent of abnormal patients.

Others have likewise shown a high prevalence of anxiety and depression in medical patients. Gross and colleagues, using the Center for Epidemiological Studies Depression Scale, studied 189 outpatients at a university hospital. They found 37 percent of the patients to be depressed (3). Linn and Yager found 42 of 100 patients screened with the Zung Self-Rating Depression Scale in a medical ambulatory care center to be depressed (5). Glass and colleagues, using the Hopkins Symptom Checklist, a precursor of the SCL-90, found that 38 percent of the patients in a university hospital outpatient medical clinic had a psychiatric disorder (2).

Others have also found that medical residents have difficulty in diagnosing anxiety and depression. Gross noted his residents were able to diagnose depression correctly in only 30 percent of patients (3). Brody found residents scored only slightly better than chance in diagnosing anxiety and depression in 149 medical clinic patients who had been administered the General Health Questionnaire (4).

Is recognition of anxiety and depression important in patient care? Snyder and colleagues found that female patients with higher average levels of depression had more problems in effectively communicating their illnesses to their physicians than less depressed women (8). Goldberg, in a study conducted in a prepaid setting, demonstrated decreased utilization of services after identification of psychosocial problems (9). Physicians who do not recognize anxiety and depression may be misled by the symptoms associated with these affects and embark on unnecessary diagnostic work-ups or dispense unnecessary medication. Such actions may convince patients that they have serious diseases, further exacerbate anxiety and depression, and lead patients to increase their demands for further studies.

The study on which this communication is based showed that combinations of patient and resident assessments are more accurate than either alone, indicating that residents are able to identify some illness patients ignore. How can residents' diagnostic talents be cultivated? One approach would administer paper and pencil tests for anxiety and depression to all patients before they see their physicians. While giving the results of these tests to residents improves their notation of these problems in the medical chart, it is not known whether this strategy would improve medical care (5). A second approach would teach residents to ask their patients whether they are anxious and depressed. The results of the study suggest that asking the patient would be a useful intervention. However, some anxious and depressed patients, in response to a direct question, deny their feelings. Possible methods to enhance resident recognition of anxiety and depression in such patients include training in the recognition of nonverbal cues, training in interviewing techniques, and limited experience with office psychotherapy.

In summary, while this study shows a 25.1 percent prevalence of anxiety and depression in outpatients and documented poor physician recognition of these affects, it also raises several questions. Can house staff physician's ability to recognize anxiety and depression be improved through training? Can it be improved by providing the physician with the results of a patient questionnaire? Will improved recognition lead to changes in the quality of care provided? Better understanding of the role of emotional factors in illness and enhanced recognition of these factors by young physicians offer the promise of more appropriate and more cost-effective care in the future.

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Evaluation of Medical Student Training in Family Assessment

Maureen Leahey and Karl Tomm, M.D.

Physicians should be able to recognize situations where family relationships play an important role in precipitating or aggravating problems in their patients. Hence, medical students should receive some training that would enable them to assess family interaction to determine when it is influencing somatic or emotional complaints. The literature pertaining to methods of educating medical students in family assessment is sparse (1–4). In a review of family therapy training programs, Beal (5) points out that most centers lack sufficiently designed conceptual frameworks of family functioning. Liddle and Halpin (6) cite a major need for the development of measurement instruments. The present communication describes a training program for developing skills in family assessment at the medical school at the University of Calgary, Alberta, Canada. It also reports on a study evaluating the effectiveness of varying teaching methods.

The Calgary Program

A course entitled The Family in Health and Illness is provided during the latter part of the first year and entails a two-hour teaching session each week for three months. Teaching methods employed in the course include lec-

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tures, videotape demonstrations of family interaction patterns, readings, small group discussion, role-playing, family-interviewing, student case presentation in small groups, and panel discussion of topical issues. The major focus of the course is family assessment. The conceptual model being taught is based largely on the family categories schema which was first developed by Nathan Epstein, John Segal, and Vivian Rakoff in 1968 and later published by Epstein, Bishop, and Levin (7). The second author of the present paper added the structural and developmental life cycle parameters to the model.

After one or more introductory lectures, the class is divided into small groups of eight students. Each group has two preceptors. One preceptor has a medical background (family physician or pediatrician) and the other a psychosocial background (family therapist, psychologist, social worker, sociologist or psychiatrist). The physician preceptor assigns families from his practice, provides background information, and facilitates student contact with the family. His presence in the small group tends to ensure that the concepts discussed are relevant to medical training. The psychosocial preceptor helps students recognize how a patient's beliefs, feelings, and behaviors may be a function of interaction patterns in the family system. The early small group sessions are devoted to analyzing edited videotapes of clinical family interviews. Preceptors encourage students to make comments about their observations to expose their biases. During one session students practice specific family interviewing skills, for example, stimulating interaction between family members. Each student is then expected to interview a family and present his assessment to the group along with his raw data base (in the form of a videotape of his actual interview). Other students in the group are encouraged to give feedback on the presenter's interviewing skills as well as on his conceptualization of the family process. Subsequently, a formal written summary of the assessment is reviewed by the preceptors.

The remainder of the course consists of a few whole class sessions focusing on issues such as single-parent families and the impact of illness on the family. The former may employ panel discussions, a videotape demonstration, or live family interviews in front of the class.

Logistic Considerations

The small group teaching method was implemented because the course managers felt that student dialogue and direct experience with families would provide a more effective learning experience than didactic lectures. However, with a class of 72 students, 72 families and 18 preceptors are required for the nine groups. In addition, videotape equipment and facilities must be provided. Thus, this teaching program is rather expensive in terms of involvement of the faculty, expenditure of student time, and use of audiovisual resources. Both faculty members and students expressed widely discrepant opinions with respect to the relative efficacy of various aspects of the teaching methods used. This led to the decision to compare the effectiveness of three methods of teaching family assessment by carrying out a specific study.

Research Study and Results

The class of 1979 was randomly divided into thirds, and each was exposed to a different teaching protocol for the first six weeks (12 hours of instruction time). Method one employed traditional classroom lectures along with demonstration videotapes prepared by the faculty. Method two used small group discussion and the same videotapes. Method three also used small groups but incorporated an experiential task in which the students conducted a family interview and presented their own videotapes to the group for discussion.

Measurement instruments were required to evaluate the student's perceptual and conceptual skills in family assessment. Since no instruments were known to be available in this specific area, separate pretests and posttests composed of short answer and essay-restricted questions were devised. Each test took 65 minutes to complete. Part A was related to the family assessment theory, while Part B was related to clinical family problems. Five segments of videotape depicting family interaction formed the basis for Part B. Two independent experts familiar with a systems model of family assessment judged the degree to which the tests measured what they intended to measure (face validity). One specialist was an educational psychologist and associate director of the Family Therapy Program, University of Calgary. The other expert was a family practitioner and manager of the course, The Family in Health and Illness. They evaluated content validity by judging the sampling adequacy of the questions in relation to the course objectives and the reading material. In addition, test question objectives were matched against Bloom's *Taxonomy of Educational Objectives* (8). The tests were judged valid. An attempt was also made in a separate substudy to ensure that the pretest was parallel with the posttest. Statistical equivalence was established for Part A and for the total test but not for Part B.

A prestudy questionnaire was devised to gather data on possible confounding variables such as the student's age, sex, marital status, and previous work experience in mental health or related areas. A poststudy questionnaire inquired about satisfaction with the teaching methods.

The results showed a significant gain in scores between premeasures and postmeasures. However, the gains did not differ significantly among the three teaching methods (9). That is, despite the greater logistics entailed in organizing small groups, interviews, and videotapes, the students involved did not show appreciably greater achievement on the measurement instruments. Women scored significantly higher on Part A (knowledge) and total scores but did not gain significantly more than men from pretest to posttest. Methods one and two students were also significantly more satisfed with their learning experience than were method three students. That is, those students who were in small group sessions and had to present their interview of a family reported the least satisfaction.

There were many limitations to the study. The instruments did not measure changes in student attitude nor changes in executive skill among the students who interviewed a family. Only conceptual and perceptual skills were evaluated by the instruments.

Following this study, a few changes were made in the course. For the first six weeks when family assessment concepts are taught, method one alone (lecture with faculty-prepared videotape demonstration) is now used. Once the initial "front-end loading" of theoretical material is given and students have an opportunity to develop basic perceptual and conceptual skills, the class is divided into small groups to practice family interviewing skills. Students are then expected to apply their assessment skills in interviewing a real family and in presenting it to their group for discussion. Thus, the intuitive judgments of course managers continue to carry the most weight in determining which teaching methods are used. The study did, however, have an impact on time allocations and sequencing. Perhaps most significantly, it enhanced student and faculty awareness of issues related to teaching efficacy.

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EDITORIAL

Faculty Promotion and Tenure

An article in this issue of the journal by Dr. Gjerde summarizes the perceptions of faculty members and department chairmen toward customary academic and institutional activities of individual faculty members that are often considered in evaluation for promotion and tenure. Among the 69 items rated by chairmen and faculty members, there were significant differences in 12. Faculty members in this study tended to rank highest those items related to research. The department chairmen reinforced the concept of research effort as an important requisite for promotion but also emphasized teaching, patient care, and contributions to the administrative and service needs of the department or school. Although Dr. Gjerde's report is limited to the insights of faculty members at only one medical school, I suspect little disagreement would be found among faculty members in other schools.

From 1955 to 1975, when existing medical schools were expanding rapidly and new schools developing, it was easier for faculty members to receive both promotion and tenure. Additional faculty members were needed at most established institutions, and there were ample alternative opportunities for faculty members at the developing medical schools. Discord between a department chairman and an individual faculty member was painful, but faculty members usually had prospects for advancement and tenure at an institution aggressively seeking new faculty.

Such is not true today. Medical schools are in a state of retrenchment. Revenue from all sources has decreased or leveled off. In many medical schools, promotion from assistant to associate professor is often accompanied by the award of tenure, which represents a long-term financial commitment by the school.

The issue of promotion and tenure will likely become more contentious than it has been. Faculty members have always sought promotion as recognition of their academic efforts. Tenure today also implies financial security at a time when job opportunities are significantly reduced for young medical school professors. The department chairman has no choice but to review carefully the faculty members proposed for the precious few tenured positions he has available. The responsibility for managing a department demands more than just the chairman's recognition of the faculty's research. Departments are responsible for teaching and patient care, and their members should participate in the governance and daily administration of the school through service on admissions, promotion, curriculum, and other committees.

Logically, if the perceptions of the faculty members and chairmen differ on consequential issues relating to promotion, this should be recognized in advance by a discussion between the participants. Gjerde proposes a job description for each faculty member. This would be reviewed annually in a meeting of the faculty member and his department chairman. In this way, there would be no misunderstanding as to the responsibilities of the young professor, and there would be acknowledgement of his successes and failures by his chairman. Certainly this process would mitigate the problem of imbalanced perceptions of the faculty members aspiring for promotion and tenure.

Most chairmen and deans of medical schools easily identify good professors among their tenured faculty members. What separates good from ordinary faculty members is difficult to characterize. In the book, *The Right Stuff*, Tom Wolfe investigated the selection of test pilots and astronauts. He was unable to describe clearly what separated the very best from the remainder. He labeled that specific feature of the most successful performer as the "right stuff." Having the right stuff was indicative of doing well under stress and constantly striving to improve one's performance. Today, medical schools more than ever need a faculty that is intellectually versatile and personally committed to the missions of the school. These faculty attributes, which are characteristic of those receiving promotion and tenure at the outstanding medical schools in this country, often elude precise definition.

The recognition and award of tenure to faculty members probably does more than anything else to determine the character, the vitality, and the quality of a medical school. To become tenured, faculty members participate in another admissions process. The process should be fair. Because it derives from human judgment, it is always imperfect. I support the discussion of promotion and tenure guidelines between department chairmen and faculty members. It is reasonable for a faculty member to want to understand what is expected of him by those who are judging his performance. It is oversimplification, however, to reduce this to a job description with annual reviews as the monitoring process.

RICHARD C. REYNOLDS, M.D., *chairman, Editorial Board*

DATAGRAM

Women Faculty Members at U.S. Medical Schools

During the past three years, the number of U.S. medical school full-time faculty members grew from 41,161 to 46,265, an increase of 12.4 percent. The proportion of the faculty members consisting of women increased from 15.2 percent in 1978 to 16.2 in 1981. The significance of this full percentage point increase in three years is pointed up by the fact that during the 10-year span of 1968–1978 the proportion of faculty members who were women increased by only 1.9 percentage point.

The growth in the total number of faculty members over the three-year period is based on individuals receiving their first full-time faculty appointment at a medical school. Of the 5,104 new appointees, 1,251, or 24.5 percent, were women; thus one out of every four newly hired full-time faculty members was female.

TABLE 2

U.S. Medical Schools with More Than 25 Percent Full-Time Female Faculty Members, 1981

School	Percent Female
Medical College of Pennsylvania	37.6
New York Medical College	32.2
University of Illinois College of Medicine	30.5
University of Puerto Rico School of Medicine	29.8
Meharry Medical College School of Medicine	28.0
Albert Einstein College of Medicine of Yeshiva University	27.8
University of Maryland School of Medicine	26.1
Columbia University College of Physicians and Surgeons	25.1

TABLE 1

Composition of Full-Time Faculty Members at U.S. Medical Schools by Degree and Sex

Faculty Members	1977–78	1980–81	Difference	Percent Increase
Males				
M.D.-Ph.D.s	1,833	2,091	258	14.1
M.D.s	21,728	24,233	2,505	11.5
Ph.D.s	9,360	10,428	1,068	11.4
Other health doctorates	347	365	18	5.2
Non-doctoral	1,262	1,353	91	7.2
Unknown	382	295	−87	−22.8
Total	34,912	38,765	3,853	11.0
Females				
M.D.-Ph.D.s	102	124	22	21.6
M.D.s	2,546	3,134	588	23.1
Ph.D.s	1,775	2,307	532	30.0
Other health doctorates	30	34	4	13.3
Non-doctoral	1,667	1,817	150	9.0
Unknown	129	84	−45	−34.9
Total	6,249	7,500	1,251	20.0

The distribution according to the degrees of the newly hired faculty members is shown in Table 1. The increase in male faculty members during this period was 11 percent, whereas the increase in female faculty members was 20 percent.

Although the figures show a continuing increase in the proportion of full-time women faculty members at U.S. medical schools, the distribution of these female faculty members is uneven. Forty-seven medical schools have over 17 percent full-time women faculty members; 23 of these schools have over 20 percent, and eight of the schools (Table 2) have more than 25 percent.

These data are derived from the Faculty Roster System at the Association of American Medical Colleges. Since more women have been recruited in recent years, slow reporting by some schools has resulted in a lower recorded percentage for women, not only for the school in question but also, to a lesser extent, for all schools in the aggregate.

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Association of American Medical Colleges
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Washington Hilton Hotel, Washington, D.C., October 31–November 5, 1981
Theme: Tomorrow's Medicine: Art and Science or Commerce and Industry?

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From Four Perspectives:

The Biomedical Scientist:
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David M. Kipnis, M.D.

The University President:
Donald Kennedy, Ph.D.

The Industrialist:
Business and Medicine: The Pursuit of Human Health
John W. Hanley

The Public:
Broadcasting Science and Medical News:
The Responsibilities and Obligations
Charles Crawford

November 3

Presiding: Thomas K. Oliver, Jr., M.D.

Presentation of AAMC Research and Flexner Awards

Keynote Address:
Disease Prevention and Health Promotion
Richard S. Schweiker

Chairman's Address:
'The Idea of a University'
Julius R. Krevans, M.D.

SPECIAL GENERAL SESSION

November 3

ACADEMIC FUNCTIONS IN AN INCREASINGLY COMMERCIAL HOSPITAL ENVIRONMENT

Moderator: Mitchell T. Rabkin, M.D.

Panel: Commercial Stress on the Academic Medical Center
Robert M. Heyssel, M.D.

Development of Investor-Owned Hospital Groups and the Implications for Traditional Medical Centers
Donald S. MacNaughton

Respondents: G. Richard Lee, M.D.
Mark S. Levitan
Samuel O. Thier, M.D.

COUNCIL OF ACADEMIC SOCIETIES

November 1

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BASIC SCIENCE EDUCATION AS THE FOUNDATION FOR ADVANCED MEDICAL PRACTICE

Presiding: Daniel X. Freedman, M.D.

The Content and Scope of Instruction in Pharmacology: Past, Present, and Future
Frederick E. Shideman, M.D.

Identification of Essential Bioscience Concepts: The Challenge for Basic and Clinical Scientists
Rubin Bressler, M.D.

November 2

Science in Medical Practice in the Year 1990
Robert W. Berliner, M.D.

Business Meeting
Presiding: Daniel X. Freedman, M.D.

COUNCIL OF DEANS

November 2

Business Meeting
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COUNCIL OF TEACHING HOSPITALS

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Business Meeting
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Implementing Competition in a Regulated Health Care System
Walter J. McNerney

GSA/MINORITY AFFAIRS SECTION

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GSA–MAS Medical Career Awareness Workshop

November 2

Regional Meetings:
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Minority Health Professions Schools
Louis Sullivan, M.D.

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MINORITY AFFAIRS PROGRAM

November 3

Tommorrow's Medicine: Beyond GMENAC
Frank S. Royal, M.D.

ORGANIZATION OF STUDENT REPRESENTATIVES

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Preventing Impairment and Failure of Medical Students
Carola Eisenberg, M.D.
Leon Eisenberg, M.D.
Joan May
Steve Phillips

Assessment of Clinical Performance: Improving the State of the Art
Victor Neufeld, M.D.
Hugh Scott, M.D.
Xenia Tonesk, Ph.D.

Business Meeting

November 1

DISCUSSION SESSION

Clinical Evaluations: The Unwritten Rules
George Baker, M.D.
Kay Colangelo, Ph.D.

Candidate for OSR Office Session

Business Meeting

Regional Meetings:
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Southern
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Central

November 2

Tomorrow's Medicine: The Economy, The Science, The Practice

Moderator: Martha Anderson, Ph.D.

Panel: Jeff Goldsmith, Ph.D.
Jane Henney, M.D.
Alvin Tarlov, M.D.

WOMEN IN MEDICINE

November 1

SYMPOSIUM ON ACADEMIC TENURE

Moderator: Roberta A. Monson, M.D.

AAMC Tenure Study and General Issues of Tenure and Promotion
Amber B. Jones

Institutional Issues
Edward J. Stemmler, M.D.

Faculty Concerns
Paul Friedman, M.D.

GENERAL SESSION: CAREER DECISION POINTS: PASSAGE OR IMPASSE?

Moderator: Norma E. Wagoner, Ph.D.

The Natural History of a Medical Academician Or Life in Medical School After Medical School
Gordon H. Deckert, M.D.

Respondents: Pearl P. Rosenberg, Ph.D.
Leah M. Lowenstein, M.D., D. Phil.

November 2

Regional Breakfast Meetings:
Western
Central
Southern
Northeast

SYMPOSIUM ON MEETING THE PRESS

Moderator: Grace M. Urrows

On Handling Administrative Matters
Michela Reichman

On Scientific Grounds
Barbara J. Norris

Pen and Pencil vs. The Camera
Ann Harrell

A Reporter's Perspective
Judy Randall

An Interviewee's Perspective
N. Lynn Eckhert, M.D.

A TALE OF O

A presentation of *A Tale of O*, a slide-tape show based on Dr. Rosabeth Moss Kanter's research for her award-winning book, *Men and Women of the Corporation.* The slide-tape demonstrates what happens to any minority individual in a work group.

DAUGHTERS OF SCIENCE

A slide-tape show from the Archives of the Medical College of Pennsylvania

Discussion Leader: Eva Ray, Ph.D.

COD/SOCIETY OF MEDICAL COLLEGE DIRECTORS OF CONTINUING MEDICAL EDUCATION

November 1

INFORMATION TECHNOLOGY: IMPLICATIONS FOR MEDICAL EDUCATION

The Philosophy Behind the Technology
Donald A. B. Lindberg, M.D.

The Changing Role of the Library in Support of Medical Education
Martin M. Cummings, M.D.

Continuing Medical Education: Can We Change the Paradigm?
Phil R. Manning, M.D.

The Role of Communication Satellites in Information Technology
M. Roy Schwarz, M.D.

FACULTY ROSTER WORKSHOP

November 2

Review of revised reporting forms and discussion of individualized school faculty listings; progress report on the utilization of the index of women and minorities.

GROUP ON BUSINESS AFFAIRS

November 3

Financial Questionnaire Workshop

Regional Meetings:
South
West
Midwest
Northeast

November 4

NATIONAL PROGRAM

Program Introduction
Robert B. Price

Welcoming Remarks
John A. D. Cooper, M.D.

Priorities and Health Policies
Edward N. Brandt, Jr., M.D.

The Support of Biomedical Research by Industry

Moderator: John A. Gronvall, M.D.

Speakers: David A. Blake, Ph.D.
Howard W. Bremer

Coping with Agreement
Jerry B. Harvey, Ph.D.

CARROLL MEMORIAL LECTURE

Federalism and the University Medical Center
Steven C. Beering, M.D.

Business Meeting
Presiding: Jerry E. Huddleston

GROUP ON INSTITUTIONAL PLANNING

November 1

COMPETITION IN THE HEALTH CARE INDUSTRY: IMPACT ON ACADEMIC MEDICAL CENTERS IN THE 1980s

Welcoming Remarks
John A. D. Cooper, M.D.

Moderator: Peter W. Butler

Speaker: Honorable Richard A. Gephardt

Hospital Perspective:
John W. Colloton

Medical School Perspective:
Ronald P. Kaufman, M.D.

Planner's Perspective:
Jeff C. Goldsmith, Ph.D.

November 2

Business Meeting
J. Stephen Smith, Chairperson

Regional Meetings

GROUP ON MEDICAL EDUCATION

November 1

SPECIAL SESSION

THE ASSESSMENT OF HOUSE STAFF PERFORMANCE

Developed in conjunction with the Association of Program Directors of Internal Medicine and the Society of Teachers of Family Medicine

Moderator: L. Thompson Bowles, M.D., Ph.D.

Overview: Xenia Tonesk, Ph.D.

Panel: Family Medicine
Hiram B. Curry, M.D.

Internal Medicine
William L. Morgan, M.D.

Surgery
Frank E. Rosato, M.D.

November 2

INNOVATIONS IN MEDICAL EDUCATION EXHIBITS

SMALL GROUP DISCUSSIONS

THE FUTURE ROLE OF MEDICAL SCHOOLS IN CONTINUING MEDICAL EDUCATION

Moderator: Gerald H. Escovitz, M.D.

Panel: Donald Brown, M.D.
Richard M. Caplan, M.D.
John M. Dennis, M.D.
Robert H. Moser, M.D.

CURRICULUM REVIEW AND REVISION: THE PROCESSES AND PRESSURES

Moderator: Alan Goldfien, M.D.

Panel: Roy Jarecky, Ed.D.
S. Scott Obenshain, M.D.
C. W. Scott, M.D.

PUBLICATIONS DIRECTED TO HEALTH PROMOTION AND EDUCATION

Moderator: Stephen E. Goldfinger, M.D.

Panel: Jordan Cohen, M.D.
Stephen E. Goldfinger, M.D.
Joe Sigler

FOSTERING THE DEVELOPMENT OF THE ACADEMIC PHYSICIAN

Moderator: John C. LaRosa, M.D.

Panel: Bernadine H. Bulkey, M.D.
Glenn W. Geelhoed, M.D.
Gerald S. Levey, M.D.
G. Donald Whedon, M.D.

U. S. CITIZENS IN FOREIGN MEDICAL SCHOOLS

Moderator: Winfield H. Scott, Ph.D.

Panel: Robert C. Combs, M.D.
Barry Stimmel, M.D.
James Van Vooren

CLINICAL REASONING (PROBLEM SOLVING): TEACHING AND EVALUATION

Moderator: Howard S. Barrows, M.D.

Panel: Peter Harasejm, Ph.D.
Bahman Joorbachi, M.D.
David B. Swanson, Ph.D.

ORGANIZING MEDICAL EDUCATION FOR THE ADULT LEARNER: WHY, WHEN AND HOW?

Moderator: S. Scott Obenshain, M.D.

Panel: Donald E. Moore, Jr., Ph.D.
Frank T. Stritter, Ph.D.

THE GEOGRAPHIC AND SPECIALTY MALDISTRIBUTION OF PHYSICIANS: DO THE STRATEGIES OF THE 70S MEET THE NEEDS OF THE 80S?

Moderator: Thomas J. Cullen, Ph.D.

Panel: James E. Carter, M.D.
Will R. Galey, Ph.D.
Eugene S. Mayer, M.D.
Wayne W. Myers, M.D.
Benjamin B. C. Young, M.D.

QUALITY CONTROL OF CLINICAL EDUCATION IN COMMUNITY HOSPITALS AND CLINICS

Moderator: Michael J. Gordon, Ph.D.

Panel: Charles P. Friedman, Ph.D.
Gerald B. Holzman, M.D.
Marcia Z. Wile, Ph.D.

SENIOR YEAR—PURPOSES/STRUCTURE

Moderator: Roger O. Lambson, Ph.D.

Panel: Fredric D. Burg, M.D.
Carl F. Hinz, Jr., M.D.

November 3

INNOVATIONS IN MEDICAL EDUCATION EXHIBITS

Regional Meetings:
Central
Southern
Northeast
Western

INNOVATIONS IN MEDICAL EDUCATION DISCUSSION GROUPS

Instructional Design or Evaluation of Introduction to Clinical Medicine Experiences
Moderator: Paula L. Stillman, M.D.

Instructional Design or Evaluation of Clinical Clerkships
Moderator: Marilyn Heins, M.D.

Instructional Design or Evaluation of Residency Programs
Moderator: Philip G. Bashook, Ed.D.

Instructional Design or Evaluation of Continuing Medical Education Programs
Moderator: David Allan, M.D.

Computer Applications in Medical Education
Moderator: Michael G. McShane, Ph.D.

Interdisciplinary Health Education
Moderator: Leonard E. Heller, Ed.D.

Faculty Development
Moderator: Hilliard Jason, M.D.

Educational Support Systems for Students
Moderator: Miriam Willey, Ph.D.

Innovative Approaches to Admissions and Student Financial Aid
Moderator: Jerry R. May, Ph.D.

November 4

PLENARY SESSION

Combined Session with the Group on Student Affairs

THE EXTERNAL EXAMINATIONS DILEMMA: IMPACT ON EDUCATIONAL PROGRAMS AND STUDENT BEHAVIOR

Moderator: Murray M. Kappelman, M.D.

Participants and Perspectives:

Should External Examinations Be Used as Gateposts for Promotions?
Fredric D. Burg, M.D.

The Comprehensive Qualifying Examination—Pro and Con
Daniel D. Federman, M.D.

Impact of External Examinations on Students' Attitude and Behavior
Robert I. Keimowitz, M.D.

Evaluating Curriculum by Means of External Examinations
T. Joseph Sheehan, Ph.D.

A Student's Perspective on External Examinations
Louis van de Beek

GME NATIONAL MEETING

Regional Summaries of Discussion of AAMC General Education of the Physician Project

GSA-GME SPECIAL SESSION

Evaluating the Use of MCAT Scores in Admissions

Moderator: Robert L. Beran, Ph.D.

Panel: Frances R. Hall
Thomas E. Norris, Ph.D.
George A. Nowacek, Ph.D.
Virginia I. Nunn, Ed.D.

Discussant: Robert F. Jones, Ph.D.

GME/SOCIETY OF MEDICAL COLLEGE DIRECTORS OF CONTINUING MEDICAL EDUCATION

November 2

APPROACHES TOWARD ENHANCING THE QUALITY OF CONTINUING EDUCATION OF HEALTH PROFESSIONALS

Moderator: George E. Miller, M.D.

Quality Defined by:

Health Care Practitioner
C. H. William Ruhe, M.D.

Provider of Programs and Services
William H. Young, D.Ed.

Accreditor
Richard S. Wilbur, M.D.

CESP MODEL—Theory and Practice
Joseph S. Green, Ph.D.
David B. Walthall, M.D.

Action Plans—Panel and Audience:

VA: Management and Reporting System and Learning Packages
Kenneth Lawrence

Center for Educational Development
University of Illinois
Ronald W. Richards, Ph.D.

Office for Research and Development for Education of Health Professionals, University of North Carolina
William Wood, M.D.

Summary
George E. Miller, M.D.

GROUP ON PUBLIC AFFAIRS

November 1

PUBLIC AFFAIRS IN A TIME OF CHANGING VALUES

Orientation Session

Presiding: Kay Rodriguez

Speakers: John F. Sherman, Ph.D.
GPA Officers

November 2

Welcome Breakfast

Moderator: Suzanne Rauffenbart

Speaker: Florence Janovic

HEALTH: A COMMON EFFORT

Speaker: Edward Brandt, M.D.

COMPETITION LEGISLATION

Panelists: John Crosby
Richard Knapp, Ph.D.

November 3

SHRINKING RESOURCES: THE IMPACT ON THE ACADEMIC MEDICAL CENTER

Speakers: John D. Chase, M.D.
Thomas J. Kennedy, Jr., M.D.

TRACK I—PUBLIC RELATIONS

MANAGING THE EFFECTIVE MEDICAL PUBLIC RELATIONS PROGRAM

Speaker: Fred Gehrung

PRESENTING MEDICINE ON NETWORK TELEVISION: A PRODUCER'S PERSPECTIVE

Speaker: Bud Lamoreaux

TRACK II—ALUMNI

ALUMNI RECORDS

Moderator: Perry Culver, M.D.

Panelists: Muriel B. Sawyer
Clifford Ohle

ALUMNI DIRECTORIES

Panelists: Dorothy Estes, M.D.
Katherine Walker

INCORPORATION OF NON-ALUMNI RESIDENTS AND FELLOWS

Panelists: Penny Hackley
Sharon A. Sweder

TRACK III—DEVELOPMENT

PERSPECTIVES ON MEDICAL CENTER DEVELOPMENT—SHARPENING THE FUND RAISER'S TOOLS

Moderator: Robert Hart

Panelists: Anthony Bridwell
E. Burr Gibson
Richard Janeway, M.D.

November 4

WORKING BREAKFAST

New Media for Conveying Your Message

Discussion Leaders: Dean Borg
Doug Buck

How to Get on the Op Ed Page and Other Places You've Never Been Before

Discussion Leaders: B. J. Norris
Suzanne Rauffenbart

Handling Controversial Matters—Some Advice from Those Who Have Been There

Discussion Leaders: Vicki Saito
Roland Wussow

The News-Making Hospital Patient

Discussion Leaders: Kathryn Costello
Al Hicks

How to Get Publicity for Your Hospital in an Overhospitalized Town

Discussion Leaders: Shirley Bonnem
Jane Snyder

Making the Best of Your Publication

Discussion Leaders: Robert Fenley
Thomas Lake

Campaign Marketing and Feasibility Studies

Discussion Leader: Robert Pierpont

Staffing and Salaries of the Academic Medical Center Development Office

Discussion Leader: John Ford

Raising Money for Capital Equipment for Medical Schools for Clinical and Academic Purposes

Discussion Leader: Seymour Alpert, M.D.

A Place or Role for Alumni in the Promotion of Public Relations and Development for Teaching Hospitals and Medical Schools

Discussion Leader: Perry Culver, M.D.

AWARDS NOMINEE PRESENTATIONS

Presiding: Vicki Saito

Publications

Michela Reichman
H. Taylor Vaden

Special Public Relations/Development/Alumni Project

Don Clayton
B. J. Norris

Electronics Program—Audio

David Ogden
Ric Spiegel

Electronics Program—Visual

Barbara Austin
Jane Peters Snyder

Total Public Relations/Development/Alumni Program—Affiliated Teaching Hospital

Dean Borg
Roland Wussow

Total Public Relations/Development/Alumni Program—Medical School and/or University Hospital

Robert Fenley
Joe Sigler

GPA BUSINESS SESSION

Presiding: Kay Rodriguez

AWARDS LUNCHEON

Presiding: Kay Rodriguez

Speaker: Dennis O'Leary, M.D.

Presentation of Awards:
John F. Sherman, Ph.D.

GROUP ON STUDENT AFFAIRS

November 2

FINANCIAL AID FORUM

Moderator: Cheryl Wilkes

New Institutional Perspectives in Student Financing
William I. Ihlanfeldt

The Private Capital Marketing Funding Perspective
James J. Unland

The Sallie Mae Perspective
Edward Fox

The Medical School Perspective
Edward J. Stemmler, M.D.

November 3

Business Meeting
Chairman: W. Albert Sullivan, Jr., M D.

November 4

THE GENERAL PROFESSIONAL EDUCATION OF THE PHYSICIAN—A STUDENT AFFAIRS PERSPECTIVE ON THE AAMC STUDY

Moderator: W. Albert Sullivan, Jr., M.D.

Faculty Participation Is Essential for Change
August G. Swanson, M.D.

Planning and Management of the Medical Education Experience
Fredric D. Burg, M.D.
George E. Ruff, M.D.

GSA/GROUP ON MEDICAL EDUCATION PROGRAM

RESEARCH IN MEDICAL EDUCATION TWENTIETH ANNUAL CONFERENCE

November 4

PRESENTATION OF SYMPOSIA

SELF-EVALUATION IN UNDERGRADUATE AND GRADUATE MEDICAL EDUCATION

Organizer: Louise Arnold, Ph.D.

Panelists: Rosalia E. A. Paiva, Ph.D.
T. Lee Willoughby
Christel A. Woodward, Ph.D.

INTERNAL EVALUATIONS OF CURRICULAR PROGRAMS: PROBLEMS, METHODS, AND RECOMMENDATIONS

Chairman: Fredric D. Burg, M.D.

Organizer: J. Gregory Carroll, Ph.D.

Panelists: J. Gregory Carroll, Ph.D.
William C. McGaghie, Ph.D.
Myra Ramos

DETERMINANTS OF PHYSICIAN IMPAIRMENT

Organizers: Carol Gilligan, Ph.D.
Carol Nadelson, M.D.
Malkah T. Notman, M.D.

Panelists: Carol Gilligan, Ph.D.
Carol Nadelson, M.D.
Malkah Notman, M.D.
Steven Shieber, M.D.
Diana M. Zuckerman, Ph.D.

NEW APPROACHES TO INSTRUCTION IN COST-EFFECTIVE CLINICAL DECISION-MAKING

Organizer: Arthur S. Elstein, Ph.D.

Panelists: Frank Hale, Ph.D.
Raymond J. Mayewski, M.D.
Marilyn L. Rothert, Ph.D.
Sankey V. Williams, M.D.

November 5

DEVELOPMENT OF A COURSE IN PREVENTION, FOCUSING ON CANCER

Organizer: Arlene R. Barro, Ph.D.

Panelists: William A. Anderson, Ph.D.
Richard Gallagher, Ph.D.
J. Dennis Hoban, Ed.D.
Ralph Ingersoll, Ph.D.
Jack J. Mason, Ph.D.
Robert E. Roush, Ed.D.
Frank Schimpfhauser, Ph.D.
Howard L. Stone, Ph.D.

ETHICAL CONDUCT OF STUDENT PHYSICIANS: THE SPECIAL PROBLEM OF CHEATING

Organizer: Fredericka Oakley

Panelists: John Sabini, Ph.D.
M. Roy Schwarz, M.D.
Frederick Sierles, M.D.
Maury Silver, Ph.D.
David J. Wolk

THE RISE AND FALL OF THREE-YEAR MEDICAL CURRICULA

Organizers: B. M. Ferrier
C. A. Woodward, Ph.D.

Panelists: John Baumber
Robert L. Beran, Ph.D.
Gerry R. Schermerhorn
Christel A. Woodward, Ph.D.

INTERPERSONAL SKILLS TRAINING FOR MEDICAL STUDENTS: EXAMINING THE STATE OF THE 'ART'

Chairman: Roland J. Weisser, Jr., M.D.

Organizer: Franklin J. Medio, Ph.D.

Panelists: Julian Bird, M.R.C.P., M.R.C.
J. Gregory Carroll, Ph.D.
Franklin J. Medio, Ph.D.
Franklin M. Putnam, M.D.
Paula L. Stillman, M.D.

IMPROVED CLINICAL EVALUATION IN UNDERGRADUATE MEDICAL EDUCATION

Organizer: David B. Swanson, Ph.D.
Panelists: Howard S. Barrows, M.D.
Charles P. Friedman, Ph.D.
Harold G. Levine
Geoffrey R. Norman, Ph.D.

November 4

PRESENTATION OF PAPERS

TEACHING CLINICAL SKILLS

Moderator: Paula L. Stillman, M.D.

A Psychometric Study of Measures of Medical Interviewing Skills
David B. Swanson, Ph.D., et al.

The Effects of Medical Information and Extent of Training on the Interviewing Skills of Medical Students
Mark L. Wolraich, M.D., et al.

Evaluating History-Taking and Physical Examination Skills: A Structured vs Traditional Approach
Debra A. DaRosa, et al.

Procedural Skills in Internal Medicine
Robert S. Wigton, M.D., et al.

CONTINUING MEDICAL EDUCATION

Moderator: Harold Levine

Accuracy of Physician's Self Reported Practice Profiles
Lynn Curry, Ph.D., et al.

Measuring Participant Learning and Change in Practice Behavior for Continuing Medical Education Programs
Ronald J. Markert, Ph.D., et al.

The Extent of Physician Participation in Continuing Medical Education Activities
Linda K. Gunzburger, Ph.D., et al.

STUDENT CHARACTERISTICS

Moderator: Frank T. Stritter, Ph.D.

A Comparative Study of Physicians from Two Decades
Sandra R. Wilson, Ph.D., et al.

Medical Students' Personality Changes from Freshmen to Seniors
Karen Kelley, M.D., et al.

The Income Expectations of Medical Students in the Time Period 1970 to 1980
Jon Veloski, et al.

EXAMINATIONS TECHNIQUES

Moderator: Barbara J. Andrew, Ph.D.

Cueing on Multiple Choice Items for Medical Students
Margaret E. Uguroglu, et al.

The 'Triple-Jump' Exercise—Further Studies of an Evaluative Technique
A. C. P. Powles, et al.

A New Examination for the Evaluation of Diagnostic Problem-Solving
Susan M. Case

CAREER CHOICE

Moderator: George Zimny, Ph.D.

Clinical Experiences: Do They Make a Difference on Specialty Choice Decision?
Nu Viet Vu, Ph.D., et al.

Personality Types of Family Practice Residents as Measured by the Myers-Briggs Type Indicator
Dona L. Harris, Ph.D., et al.

Longitudinal Changes in Specialty Preferences: Sex Differences

Larry D. Gruppen, et al.

STANDARD SETTING

Moderator: John S. Lloyd, Ph.D.

Assessing the Reliability and Validity of Educational Standards
Robert B. Parks, Ph.D.

External and Internal Tests of Preclinical Learning: Content Representativeness, Item Educational Emphasis, and Student Achievement
William C. McGaghie, et al.

Professional Competence Assurance Program (PROCAP): Physician Performance in the Ambulatory Care of 1229 Patients with Hypertension
David S. Gullion, M.D., et al.

November 5

NEW MCAT ANALYSIS

Moderator: Arthur I. Rothman, Ed.D.

The Overall Validity of the New MCAT
Jon Veloski, et al.

Predicting Medical School Performance Using the Old and New MCAT
Alan Hull, Ph.D., et al.

Using the New MCAT and NBME Subject Examinations to Predict Performance in a Medical School Behavioral Sciences Course
John M. Beaton, Ph.D., et al.

IMPACT OF PROGRAMS ON CLINICAL PERFORMANCE

Moderator: Edwin F. Rosinski, Ed.D.

Unraveling the Meaning of Global Comparative Ratings of Interns
C. A. Woodward, et al.

Long-Term Stability of Graduates' Rating of Their Educational Programs: Or—What is to be Gained by Post-Program Follow-Up Surveys?
J. Crook, et al.

A Comparative Survey of Former Residents' Professional Activities and Retrospective Ratings of Training Program Effectiveness
Richard B. Countiss

CURRICULUM EVALUATION

Moderator: Reed Williams, Ph.D.

Curriculum Evaluation: A Many Splendored Thing?
William Weston, III, M.D., et al.

Structuring Clinical Medical Education: A Problem Specific, Performance Based Framework
Emil R. Petrusa, Ph.D.

Goal Attainment Scaling in a Psychiatric Clerkship
Grant D. Miller, M.D., et al.

The Impact of Participation in a Primary Care Track Program on Medical Student Career Decision
Mike Mallea, M.D., et al.

ISSUES IN SELECTION

Moderator: C. Benjamin Meleca, Ph.D.

Applicant Characteristics, School Character, and the Admission Selection Process
Carl N. Edwards

Comparison of Perceived Stress Levels Among Medical and Law Students
Marilyn Heins, M.D., et al.

A Multicomponent Validity Study of House Staff Selection Process
Charles P. Friedman, Ph.D., et al.

INSTRUMENT VALIDATION

Moderator: Lawrence Tremonti, M.D.

The Validity of Simulated Patients
G. R. Norman, et al.

A Longitudinal Study of Observational Ratings by Clinical Faculty
John H. Littlefield, Ph.D., et al.

The Instructor Satisfaction Questionnaire: Its Development and Validation
Anne Roth, et al.

Minutes of AAMC Assembly Meeting

November 3, 1981

Washington Hilton Hotel, Washington, D. C.

Call to Order

Dr. Julius R. Krevans, AAMC Chairman, called the meeting to order at 8:15 a.m.

Quorum Call

The Chairman recognized the presence of a quorum.

Consideration of the Minutes

The minutes of the October 28, 1980, Assembly meeting were approved without change.

Report of the Chairman

Dr. Krevans reported to the Assembly on the activities of the Executive Council during the preceding year. He gave special attention to the Council's response to budgetary and legislative proposals, which resulted in the Association's setting as its priorities research and research training, student financial assistance, and support for the Medicaid and Medicare programs. He also mentioned several Association committees and their reports and discussed some of the policy issues on which the Council had acted during the past year.

Dr. Krevans extended a special thanks to the following individuals, whose terms on the Association's Administrative Boards had expired:

From the Council of Deans: Steven C. Beering, Allen W. Mathies.

From the Council of Academic Societies: Carmine D. Clemente, Brian A. Curtis.

From the Council of Teaching Hospitals: Dennis R. Barry, John W. Colloton, Robert K. Match.

From the Organization of Student Representatives: Lisa Capaldini, Wendy Crum, Susan Haack, Jo Linder, Manuel Marquez, Steven Phillips, Louis van de Beek.

Report of the President

Dr. John A. D. Cooper provided the Assembly with the latest information about the fiscal year 1982 budget and appropriations process, including OMB action to defer expenditures of funds in excess of the Administration's September budget. Dr. Cooper anticipated that pressure to reduce funding for programs of interest to medical centers would not abate.

The Association has been notified that the Pew Memorial Trust would support its proposal for Regional Institutes on Geriatrics and Medical Education. The steering committee for this new AAMC initiative would be chaired by Joseph E. Johnson, III, M.D., Chairman of Medicine at the Bowman Gray School of Medicine.

Another new Association project, a study of the General Professional Education of the Physician, had been funded by the Kaiser Family Foundation. The Advisory Panel for this project will be chaired by Steven Muller, President of Johns Hopkins University. William Gerberding, President of the University of Washington, Seattle, will serve as vice chairman. The advisory committee will have broad representation from university and medical school faculties and the medical profession.

Dr. Cooper discussed the Association's activities with respect to the competition issue. Although there did not appear to be sufficient consensus in Congress for enactment of any of the existing competition proposals, Dr. Cooper predicted that medical centers and teaching hospitals would nevertheless be subject to mounting competitive forces and that there would be increased regulatory approaches to containing costs.

Report of the Council of Deans

Dr. Steven C. Beering reported that the spring meeting of the Council of Deans had been devoted to "Crosscurrents of the Eighties." An additional feature of that program had been an orientation session for new deans. The Council had amended its rules and regulations to expand the size of its Administrative Board and to include as a member of the Board the Immediate Past Chairman of the Council. Dr. William Luginbuhl was named as new Chairman of the Council. Dr. Richard Janeway was named Chairman-Elect. New members of the Administrative Board were M. Roy Schwarz, D. Kay Clawson, Arnold L. Brown, and William B. Deal.

Report of the Council of Academic Societies

Dr. Daniel X. Freedman stated that the February interim meeting of the CAS had dealt with the proposed single route to licensure and external evaluation examinations. In March the Council had held an emergency meeting with representatives of the Reagan Administration to discuss budgetary matters. The CAS program at the Annual Meeting had included sessions on the appropriate college preparation for medical school, the role of basic scientists in clinical departments, the reinforcement of basic science education during clinical education, and the identification of basic science concepts for medical student learning.

Report of the Secretary-Treasurer

Mr. Stuart Marylander, in his report as Secretary-Treasurer of the Association, reviewed the activities of the Audit Committee and the Association's financial statement.

> ACTION: *On motion, seconded, and carried, the Assembly adopted the report of the Secretary-Treasurer.*

Report of the Council of Teaching Hospitals

Mr. Marylander reported that the Council of Teaching Hospitals' principal project throughout the year had been its study of the distinctive characteristics and related costs of teaching hospitals. Although the study had been delayed by problems in obtaining all of the required data, it was anticipated the study would be ready for publication early in the next year.

Report of the Organization of Student Representatives

Mr. Grady Hughes reported that the OSR had increased its efforts to affect Congress on student financial assistance issues. The OSR had also developed due process guidelines and had distributed an issue of the OSR Report on physician manpower. During the past year the OSR had also worked on a number of other projects, including a study of ethical issues at medical schools and a network for exchange of housing information. At the Annual Meeting the OSR had sponsored several discussion sessions and had passed a number of resolutions which would be transmitted to the Council of Deans. Ed Schwager was named Chairperson-Elect of the OSR.

Election of New Members

> ACTION: *On motion, seconded, and carried, the Assembly by unanimous ballot elected the following organizations, institutions, and individuals to the indicated classes of membership:*

Institutional Membership: East Carolina University School of Medicine; Marshall University School of Medicine; Texas A & M University College of Medicine; Ponce School of Medicine; University of South Carolina School of Medicine; Northeastern Ohio Universities College of Medicine.

Academic Society Membership: American Academy of Physical Medicine & Rehabilitation; American Society of Human Genetics; Child Neurology Society; Association of Directors of Medical Student Education in Psychiatry, Inc.

Teaching Hospital Membership: The Aultman Hospital Association, Canton, Ohio; The Carney Hospital, Boston, Massachusetts; Children's Hospital Medical Center, Akron, Ohio; Danbury Hospital, Danbury, Connecticut; Detroit Receiving Hospital and University Health Center, Detroit, Michigan; Frankford Hospital, Philadelphia, Pennsylvania; Froedtert Memorial Lutheran Hospital, Milwaukee, Wisconsin; Saint Joseph's Hospital, Milwaukee, Wisconsin; Saint Mary's Hospital, Grand Rapids, Michigan; Saint Mary of Nazareth Hospital, Chicago, Illinois; Tampa General Hospital, Tampa, Florida; University Hospital, Stony Brook, New York; Veterans Administration Medical Center, Des Moines, Iowa.

Corresponding Membership: Grant Hospital, Columbus, Ohio; Saint Elizabeth Medical Center, Dayton, Ohio; Veterans Administration Medical Center, Fresno, California; Veterans Administration Medical Center, Mountain Home, Tennessee.

Individual Membership: List attached to archive copy of these minutes.

Distinguished Service Membership: F. Marian Bishop, Robert Derzon, Sidney Lewine, Hiram Polk, Robert Van Citters, Irvin Wilmot.

Emeritus Membership: Lad Grapski, John Lattimer, Emanuel Papper.

Amendments to the Association Bylaws

ACTION: *On motion, seconded, and carried, the Assembly by unanimous ballot amended the Association bylaws to read as follows:*

Article I, Section 2B:

Distinguished Service Members shall be persons who have been actively involved in the affairs of the Association and who have made major contributions to the Association and its programs.

Article I, Section 3E:

Distinguished Service Members shall be recommended to the Executive Committee by either the Council of Deans, the Council of Academic Societies, or the Council of Teaching Hospitals. The Executive Committee shall present Distinguished Service Member nominations to the Executive Council.

Article VI, Section 2:

The Executive Council shall consist of nine members elected by the Assembly and ex officio the Chairman, Chairman-Elect and Immediate Past Chairman of the Assembly and each of the three Councils created by these bylaws, the President of the Association, and the Chairperson and Chairperson-Elect of the Organization of Student Representatives, all of whom shall be voting members. Of the nine members of the Executive Council elected by the Assembly, one shall be a member of the Council of Academic Societies, one shall be a member of the Council of Teaching Hospitals, six shall be members of the Council of Deans, and one shall be a Distinguished Service Member. The elected members of the Executive Council shall be elected by the Assembly at its annual meeting, each to serve for three years or until the election and installation of a successor. Each shall be eligible for re-election for one additional term of three years. Each shall be elected by majority vote and may be removed by a vote of two-thirds of the members of the Assembly present and voting.

Article VI, Section 7:

In the event of a vacancy on the Executive Council, either through resignation of an elected member or election of such a member to an ex officio seat on the Council, the remaining members of the Council may appoint a successor to complete the unexpired term. The Council is authorized at its own discretion to leave a vacancy unfilled until the next annual meeting of the Assembly. Members of the Executive Council are eligible for election to the Council for two full terms following completion of any partial term.

Report of the Resolutions Committee

There were no resolutions reported to the Resolutions Committee for timely consideration and referral to the Assembly.

Report of the Nominating Committee

Dr. John E. Jones, Chairman of the AAMC Nominating Committee, presented the report of that committee. The committee is charged by the bylaws with reporting to the Assembly one nominee for each officer and member of the Executive Council to be elected. The following slate of nominees was presented: AAMC Chairman-Elect: Steven C. Beering; Executive Council, COD representatives: John E. Chapman, M. Roy Schwarz; Executive Council, COTH representative: Mark S. Levitan; Executive Council, CAS representative: Frank C. Wilson, Jr.

ACTION: *On motion, seconded, and carried, the Assembly approved the report of the Nominating Committee and elected the individuals listed above to the offices indicated.*

Installation of New Officers

Dr. Thomas K. Oliver, Jr. was installed as the AAMC's new Chairman at the plenary session immediately following the Assembly meeting.

Adjournment

The Assembly adjourned at 9:10 a.m.

Annual Report

1980–81

Note: The President's Message appeared in the January issue of the *Journal of Medical Education.*

Executive Council, 1980-81

Julius R. Krevans, chairman
Thomas K. Oliver, Jr., chairman-elect
John A. D. Cooper, president

Council Representatives:

COUNCIL OF ACADEMIC SOCIETIES

David M. Brown
Carmine D. Clemente
Daniel X. Freedman
Virginia V. Weldon

DISTINGUISHED SERVICE MEMBER

Manson Meads

COUNCIL OF DEANS

Steven C. Beering
John E. Chapman
John W. Eckstein
Richard Janeway
William H. Luginbuhl
Allen W. Mathies, Jr.
Richard H. Moy
Leonard M. Napolitano
Edward J. Stemmler

COUNCIL OF TEACHING HOSPITALS

John W. Colloton
Stuart J. Marylander
Mitchell T. Rabkin
John Reinertsen

ORGANIZATION OF STUDENT REPRESENTATIVES

Lisa Capaldini
Grady Hughes

Administrative Boards of the Councils, 1980-81

COUNCIL OF ACADEMIC SOCIETIES

Daniel X. Freedman, chairman
David M. Brown, chairman-elect
Carmine D. Clemente
Brian A. Curtis
William F. Ganong
Lowell M. Greenbaum
Robert L. Hill
T. R. Johns, III
Joseph E. Johnson, III
John B. Lynch
Virginia V. Weldon
Frank C. Wilson

COUNCIL OF DEANS

Steven C. Beering, chairman
William H. Luginbuhl, chairman-elect
David R. Challoner
John E. Chapman
John W. Eckstein
Richard Janeway
Allen W. Mathies, Jr.
Richard H. Moy
Leonard M. Napolitano
Edward J. Stemmler

COUNCIL OF TEACHING HOSPITALS

Stuart J. Marylander, chairman
Mitchell T. Rabkin, chairman-elect
Dennis R. Barry
James W. Bartlett
John W. Colloton
Fred J. Cowell
Spencer Foreman
Robert E. Frank
Earl J. Frederick
Mark S. Levitan
Robert K. Match
Haynes Rice
John A. Reinertsen
John V. Sheehan

ORGANIZATION OF STUDENT REPRESENTATIVES

Lisa Capaldini, chairperson
Grady Hughes, chairperson-elect
Wendy Crum
Susan M. Haack
Jo Ellen Linder
Manuel Marquez
Dan Miller
Steven G. Phillips
Edward Schwager
Michael Tom
M. Louis van de Beek

The Councils

Executive Council

Between the Annual Meetings of the Association, the Executive Council meets quarterly to deliberate policy matters relating to medical education. Issues are brought to the Council's attention by member institutions or organizations and from the constituent Councils. Policy matters considered by the Executive Council are first referred to the Administrative Boards of the constituent Councils for discussion and recommendations before final action.

Agenda items at the traditional December retreat for the Association's officers and executive staff presaged many of the issues that would appear on the Executive Council's agenda through the year: price competition in the health care sector, proposed changes in the examination sequences of the National Board of Medical Examiners and the Federation of State Medical Boards, United States citizens studying medicine abroad, the final report of the Graduate Medical Education National Advisory Committee, and changes in national policy affecting medical schools and teaching hospitals. Retreat participants engaged in a lively discussion on activities at medical centers that could be characterized as a possible "commercialization" of the academic enterprise. Since it was felt that this important topic would benefit from more widespread discussion among the Association's constituency, it was agreed that the theme of the 1981 Annual Meeting would be "Tomorrow's Medicine: Art and Science or Commerce and Industry?" A new Association project for a three year study to review the general professional education of the physician was also discussed.

The 1980 Presidential and Congressional elections set the stage for a comprehensive review of national policies and priorities. Consequently, during the past year the Executive Council has devoted considerable attention to analyzing new budget proposals for their impact on medical center activities, in reviewing existing Association positions on national policy issues for their applicability and relevance to the new political structure, and in developing and formulating responses to new proposals from the Administration and Congress.

The Executive Council endorsed a strategy emphasizing that all programs important to medical centers should be supported and funded at levels equal to the 1980 Congressional appropriations plus adjustments for inflation. The priorities set by the Executive Council were research and research training, student financial aid, programs of the Veterans Administration, institutional support including financial distress grants, and special project grants. The Executive Council also expressed its opposition to the proposed cap on Medicaid expenditures and changes in the program that would increase the flexibility of states to reduce eligibility, scope of services or freedom of choice in selecting providers. It was decided that the Association would support health planning by state and local authorities, and would not include the renewal of P.L. 93-641, the National Health Planning and Resources Development Act, as a priority of the Association. Particular efforts were required to assure the continued integrity of the National Research Service Awards program. The long-established practice under which the federal government had provided an element of institutional support for NRSA trainees came under attack. After carefully considering the options, the Executive Council adopted as Association policy the formal endorsement of the overriding importance of federal support for the training of biomedical and behavioral scientists and the principle that institutional support and indirect costs reimbursement are essential components of training awards.

In other research related action, the Executive Council decided that although federal support for independent research and development in universities was desirable, such funding should not occur through the indirect cost mechanism. It was feared that further increases in the indirect cost pool would reduce funds available for direct research costs, cause dissension among faculty members, provide further stimulus for re-examination of rates of increase in indirect costs rates, and jeopardize the current BSRG dedicated program at NIH.

Two reports by other organizations were deemed sufficiently critical to the Association's constituents to warrant formal responses. The Executive Council was troubled by several recommendations in the final report of the Graduate Medical Education National Advisory Committee, particularly those relating to reductions in medical class size. In its response the Association said, "If the educational capacity of our medical schools is to be reduced, sufficient time must be permitted for planning and implementing the reduction. Changes in class size must take into account the diversity of the institutions, their sponsorship, their special missions, and their multiple sources of support." The Urban Institute, under contract with the Department of Health and Human Services, had examined the probable impact on undergraduate medical education of a reduction in federal subsidies, and concluded that loss of such support would not adversely impact medical education. An important corollary of this conclusion was that student loan funds must be readily available. The Association concurred with the need to ensure unlimited access to student loans, but also expressed concerns about the applicability of the report's findings for special populations of applicants and students.

Several items relating to graduate medical education appeared on the Executive Council's agenda. For five years the parent organizations of the Liaison Committee on Graduate Medical Education (now the Accreditation Council for Graduate Medical Education) had been working on revisions in the General Requirements Section of the Essentials of Accredited Residencies in Graduate Medical Education. Although there were still some concerns about the sections on evaluation and the eligibility of graduates of non-LCME accredited schools, the Executive Council joined the other four parent organizations in approving the General Essentials. The new essentials will place greater responsibility on the institutional sponsors of graduate medical education for the quality of their programs and should considerably strengthen the ability of the residency review committees and the ACGME to require that educational programs be provided adequate resources and supervision. The Council also developed a paper on due process for students and residents and one on changes in Medicare reimbursement policies on house staff moonlighting. Both papers were distributed to the AAMC constituency.

The Executive Council's continuing review of important medical education policy areas was augmented by the work of a number of committees. At the January meeting, Robert E. Tranquada, Chairman of the ad hoc Committee on Competition, presented that committee's report. The report was accepted by the Council, and served as the basis for a widely distributed Association monograph on "Price Competition in the Health Care Marketplace: Issues for Teaching Hospitals."

The ad hoc External Examinations Review Committee, under the chairmanship of Carmine D. Clemente, was charged with studying a number of existing and proposed examinations of medical knowledge, including the National Board of Medical Examiners tests and the Federation Licensing Examination of the Federation of State Medical Boards. The Committee's report, "External Examinations for the Evaluation of Medical Education Achievement and for Licensure," was adopted unanimously at the Council's June meeting. The report concluded that the NBME's prototype Comprehensive Qualifying Examination could not evaluate the skills and personal professional qualifications that faculty of LCME-accredited schools evaluate as students progress through their curriculum. The report recommended that the Federation be urged not to require the FLEX I examination for graduates of LCME-accredited schools. The Committee further recommended that the ACGME require graduates of non-LCME accredited schools to pass both a written examination equivalent to the Parts I and II exams of the NBME certification sequence and a practical hands-on examination to evaluate clinical skills and personal professional qualifications. Licensure for independent practice, after a period of graduate medical education, for graduates of LCME-accredited schools should continue to be based on either passing the National Board certification sequence or the FLEX examination. For graduates of non-LCME accredited schools, unrestricted licensure should be based on passing the FLEX examination. The Executive Committee has met with representatives of the Federation to discuss the report; discussions continue. Prior to adoption of this report, the Executive Council at its March meeting had asked the Association representatives to the National Board to express their opposition to a proposed cooperative agreement between the Board and the Federation for the development and implementation of the FLEX I-II examination sequence.

An ad hoc Committee on Foreign-Chartered Medical Schools and U.S. Nationals Studying Medicine Abroad, under the leadership of William H. Luginbuhl, deliberated about issues raised in a report by the General Accounting Office entitled, "Policies on U.S. Citizens Studying Medicine Abroad Need Review and Reappraisal." The committee specifically was concerned about those foreign-chartered medical schools that maintain offices in the United States to recruit U.S. citizens or to place them in U.S. hospitals for clinical experiences. The committee agreed with GAO findings that the schools to which most U.S. citizens have access do not provide a medical education comparable to that available in the United States. The committee concluded that the current eligibility standards for certification by the Educational Commission for Foreign Medical Graduates are inadequate and recommended that the ECFMG be urged to adopt the examination methods recommended by the Association's ad hoc External Examinations Review Committee. The Executive Council approved and adopted the report in June. This report, "Quality of Preparation for the Practice of Medicine in Certain Foreign-Chartered Medical Schools," has been forwarded to the ACGME for incorporation into its deliberations on the standards of eligibility for graduates of non-LCME accredited medical schools.

The Executive Council has encouraged staff to seek funding for a new Association project on geriatrics and medical education. As a part of this new initiative, Robert N. Butler, Director of the National Institute on Aging, was invited to speak at a joint meeting of the Administrative Boards in September.

The September meetings of the Administrative Boards and the Executive Council also featured a special day-long session entitled, "Strategies for the Future," at which members heard presentations by Robert J. Blendon, Senior Vice President, the Robert Wood Johnson Foundation; William B. Schwartz, Professor of Medicine, Tufts University School of Medicine; David R. Challoner, Dean, Saint Louis University School of Medicine; and Julius R. Krevans, Dean, University of California, San Francisco, School of Medicine, on issues facing medical schools and teaching hospitals and their faculties and students in the 1980s. Small group sessions expanded on these discussions and began to consider appropriate Association activities for helping constituents with these problems.

The Executive Council considered and recommended to the Assembly two changes in the Association bylaws. The first would slightly modify eligibility criteria for election to Distinguished Service Membership. The second would specify the composition of the Executive Council to include the immediate past chairman and the chairman-elect of each Council. Further, the size of the Executive Council would be expanded by one to include the immediate past chairman of the Assembly.

During the year the Executive Council continued to oversee the activities of the Group on Medical Education, the Group on Student Affairs, the Group on Public Affairs, the Group on Business Affairs, and the Group on Institutional Planning.

The Executive Council, along with the Secretary-Treasurer, Executive Committee and the Audit Committee, exercised careful scrutiny over the Association's fiscal affairs, and approved a modest expansion in the general funds budget for fiscal year 1982.

The Executive Committee met prior to each Executive Council meeting and conducted business by conference call as necessary. The

Executive Committee met twice with the Association of Academic Health Centers' executive committee to facilitate coordination and communication between the organizations. The Executive Council also met with Department of Health and Human Services Secretary Richard S. Schweiker and Chairman Henry A. Waxman of the House Subcommittee on Health and the Environment to discuss issues of concern to the academic medical community.

Council of Deans

The Council of Deans held two major meetings during the 1980–81 year including the business meeting conducted at the Association's Annual Meeting in Washington, D.C. and a spring meeting in Colorado Springs, Colorado. In addition, the COD Administrative Board met quarterly to review Executive Council agenda items of significant interest to the deans and to carry on the business of the COD. More specific concerns were addressed by smaller groups of deans brought together by common interests.

Preceding the annual business meeting, Dr. Cornelius J. Pings, Director of the National Commission on Research and Vice Provost and Dean of Graduate Studies at the California Institute of Technology, addressed the Council on the relationship between academic research and the federal government. He highlighted a number of the key recommendations appearing in the Commission's reports. The primary discussions at the business meeting focused on an analysis of the various health manpower proposals and the recent efforts to amend the statutory authority of the National Institutes of Health. Progress reports were presented by the Committee on the Identification of the Unique Characteristics of the Teaching Hospital and the Committee on Competition. In addition, the Council adopted a statement opposing the action of the Board of Regents of the University of the State of New York in its decision to accredit certain foreign medical schools.

Eighty-nine deans attended the March 29–April 1 spring meeting devoted to "Academic Medicine—Crosscurrents of the Eighties." Robert M. Heyssel, Executive Vice-President and Director of The Johns Hopkins Hospital, and Emmett H. Heitler, former chairman of the Board of the Samsonite Corporation, discussed the academic medical center and the competitive environment. Arnold S. Kelman, Editor of the *New England Journal of Medicine*, elaborated on his concerns about the commercialism of medicine. A perspective on the Government Accounting Office report on U.S. foreign medical students was provided by William B. Deal, Dean of the University of Florida College of Medicine. The relationship of medicine to the university was addressed by William H. Danforth, Chancellor of Washington University, and Donald Kennedy, President of Stanford University. Edward N. Brandt, Jr., Assistant Secretary for Health, Department of Health and Human Services, presented a Washington perspective on medicine in the 1980s. The presentations stimulated much discussion among the deans regarding academic medicine in the next decade.

The spring meeting was preceded by an orientation session for new deans in which they were introduced to the staff, resources and programs of the AAMC. Several COD Board members gave personal insights to the new deans "on being a dean." The business meeting included an extended discussion of the Administration's recent budget proposals and national legislation affecting biomedical research, medical education and health services.

Additional agenda items included consideration of the Federation of State Medical Board's proposed "single route to licensure"; a report on the deliberation of an AAMC committee on foreign medical schools; the report from the AAMC ad hoc Committee on Competition; processes and procedures for academic and disciplinary decision-making related to students and house officers; and a progress report on the study of the unique characteristics of the teaching hospital.

Several items considered by the COD Administrative Board during its quarterly meetings deserve special note: the modification of the Health Care Financing Administration policy on resident moonlighting and the formulation of the AAMC response to the GMENAC Report. In addition, the Board approved a change in the COD Administrative Board.

Sections of the Council meeting during the year were the Southern deans, the Midwest deans, deans of private freestanding schools, and the deans of the new and developing community based medical schools.

Council of Academic Societies

In its 13 year history, the Council of Academic Societies has not been more active or played a more important role in AAMC activities than in 1980–81. Membership in CAS now totals 71 academic societies representing over 100,000 U.S. medical school faculty members from almost every basic and clinical science discipline.

Three major meetings dominated the activities of CAS during the last year. At the 1980 fall meeting, the CAS sponsored small group discussions on four timely issues: development of faculty leaders for research careers, competitive marketing of medical services, increasing interspecialty cooperation in graduate medical education, and the changes in faculty responsibilities in accounting for research activities. In addition, Jules Hirsch, Professor and Senior Physician, Department of Human Behavior and Metabolism, Rockefeller University, addressed the Council on the status of clinical investigation and the decline of medical student interest in research. Also in conjunction with the fall meeting, a CAS "Forum on Faculty" was held; AAMC staff members presented data on the changing characteristics of faculty and of factors influencing the choice of academic careers, and Jeremiah A. Barondess, Clinical Professor of Medicine at Cornell University, discussed the role of volunteer clinical faculty.

The February CAS Interim Meeting focused almost entirely on proposed changes in the National Board of Medical Examiners sequence and the single route to licensure (FLEX I-II) advocated by the Federation of State Medical Boards. Presentations were made by officers of the Federation and the National Board regarding the proposed changes with special attention to the development by the NBME of the Comprehensive Qualifying Examination (CQE) for use as FLEX I. In small discussion groups the Council examined a 330-question sample from the CQE Prototype. The following day leaders from each group reported on their respective group's discussion and it was during the course of these reports that the Council reached a consensus opposing implementation of a single route to licensure. Members of the Association's ad hoc External Examinations Review Committee were present at the meeting and many of the concerns expressed were subsequently incorporated into that committee's final report.

In addition to the regular fall and interim meetings, the CAS held its first public affairs meeting. Public Affairs Representatives from 47 of the 71 member societies convened to discuss the Reagan Administration budget proposals. Presentations were made by Robert J. Rubin, Special Assistant to the Secretary, Department of Health and Human Services; Herbert Pardes, Director, National Institute of Mental Health; Robert Graham, Acting Administrator, Health Resources Administration; Donald S. Fredrickson, Director, National Institutes of Health; and William J. Jacoby, Chief Medical Director, Veterans Administration. AAMC President John A. D. Cooper discussed the possible impact of the budget proposals on medical schools and teaching hospitals and their faculties.

The CAS Administrative Board conducted the business that arose throughout the year during quarterly meetings held before each Executive Council meeting. Preceding its meetings, the Board had informal discussions with Stephen A. Grossman, Majority Counsel, Senate Committee on Labor and Human Resources; Sheila P. Burke, professional staff member, Senate Finance Committee; and George A. Keyworth, Director, White House Office of Science and Technology Policy.

The quarterly *CAS Brief* continued to inform medical school faculty about current policy issues. The Association also continued its CAS Services Program for societies desiring special legislative tracking and office management services. Five societies participated in the program in 1980–81: American Federation for Clinical Research, Association of Professors of Medicine, American Neurological Association, American Academy of Neurology, and Association of University Professors of Neurology.

Council of Teaching Hospitals

The Council of Teaching Hospitals held two general membership meetings during 1980–81. The theme for the COTH General Session at the fall annual meeting was "The High Cost Patient: Implications for Public Policy and Teaching Hospitals." Featured speaker Marc J. Roberts, Professor of Political Economy and Health Policy at the Harvard School of Public Health, emphasized that resource limitations and the pressures for cost containment would force society to make difficult social choices regarding the allocation of health benefits. He believed that the greatest impact would be on the high cost patient. He recommended that teaching hospital executives consider strategies to maintain the hospital's place in the health care market, develop an internal plan to make choices and implement them with consensus, centralize resource allocation, reassess health planning, develop systematic data on the cost-benefit production function of health care, and address the consequences of devoting resources to different classes of patients.

Frank Moody, Chairman of Surgery at the University of Utah College of Medicine, and Irvin Wilmot, Executive Vice President, New York University Medical Center, were respondents to Dr. Roberts' remarks.

On May 6–8, 1981, COTH's fourth spring meeting was held in Atlanta, Georgia. In his keynote speech on "Health Care and The American Economy in the Eighties," Ralph S. Saul, Chairman and Chief Executive Officer of INA Corporation, asserted that the principal task for both health care providers and consumers would be "to make do with less." He emphasized that funds for health care are a finite resource and improved management would be needed to get more for the dollars expended.

Dennis S. O'Leary, Dean for Clinical Affairs at George Washington University Medical Center, recounted the hospital's experiences in the aftermath of the attempt to assassinate President Reagan. Dorothy P. Rice, Director of the National Center for Health Statistics, presented detailed tables and charts on "Morbidity, Mortality and Population Trends in the United States," describing the dramatic increase in the percentage of the elderly in the total U.S. population. The implications of the trends described by Ms. Rice were discussed by J. Alexander McMahon, President of the American Hospital Association, speaking on "The Implications for Traditional and Emerging Services"; Saul J. Farber, Acting Dean of the New York University School of Medicine, on "The Implications for Educational and Research Objectives"; and Loretta Ford, Dean of the School of Nursing at the University of Rochester, on "The Implications for the Spectrum of Nursing Services." William C. Richardson, Associate Dean at the School of Public Health at the University of Washington, spoke on "Physician Performance in Prepaid Medical Plans."

Individual workshops enabled small groups to discuss consumer choice and competition and their potential effects on teaching hospitals. In another session Veterans Administration medical center directors met with representatives of the VA's Chief Medical Director.

Representative Barber B. Conable, ranking minority member of the House Ways and Means Committee, spoke on "Social Security, Medicare, and Medicaid: Likely Developments in the Eighties." J. Ira Harris, general partner of Salomon Brothers, spoke on "Acquiring Capital in the Eighties," warning that drastic changes in capital financing would have to be met by major changes in hospital management philosophy. Speaker Henry E. Simmons, a principal with the accounting/management consulting firm of Peat, Marwick, Mitchell and Company, in an address on "American Industry: The New Tough Buyer of Health Care," declared that "competition is the future" and "the traditional hospital setting is dead." He further predicted that, as major buyers of health care, government and big business will seek new systems of health care.

The meeting's last session presented a report on the status of the COTH study on diagnostic case mix and other distinctive features of teaching hospitals. Mark S. Levitan, Executive Director of the Hospital of the University of Pennsylvania and Chairman of the AAMC ad hoc Committee on the Distinctive Characteristics and Related Costs of Teaching Hospitals, provided an overview, describing some of the problems that had been experienced with the data and their collection, and presenting preliminary statistics that had been compiled.

The COTH Administrative Board met five times to conduct the Council's business and to review and discuss Executive Council agenda items. Throughout the year the Administrative Board examined the various "pro-competition" proposals that have been introduced, their potential impact on teaching hospitals, and alternatives for addressing the issues. In other deliberations, the Administrative Board focused on several topics: the report of the Association's ad hoc Committee on Competition, interaction with the Commission on Professional and Hospital Activities, the revised General Requirements Section of the Essentials of Accredited Residencies in Graduate Medical Education, Medicare's reimbursement policy on resident moonlighting, the Association's project to describe and quantify the case mix and service characteristics of teaching hospitals, and the potential impact on teaching hospitals of various Medicare and Medicaid proposals contained in the budget reconciliation legislation under consideration by the Congress.

Preceding four of its meetings, the Administrative Board held informal discussions with various governmental officials and allied health organization executives. Howard Newman, Administrator of the Health Care Financing Administration, discussed the agency's objectives under the Carter Administration. Gail Warden, Executive Vice President of the American Hospital Association, and Howard Berman, AHA Group Vice President, spoke on the future of the Commission on Professional and Hospital Activities and other health care topics of mutual interest. Shiela P. Burke, professional staff member of the Senate Finance Committee, reviewed the budget reconciliation process and the various Medicare and Medicaid spending reduction proposals. Carolyne Davis, Administrator of HCFA, discussed that agency's activities under the Reagan Administration.

Organization of Student Representatives

During the past year five medical schools that had previously not participated in OSR chose to designate a representative, for a total of 117 schools active in the Organization. Ninety-four sent students to the annual meeting during which OSR sponsored discussion sessions on curricular reform vis-a-vis the "new biology," the National Resident Matching Program, sociobiology, lessons for U.S. health care from other countries, and other topics of special interest to students. This year students also attended the Women in Medicine general session. During its business meeting, the OSR passed 17 resolutions on issues such as improved teaching of cost effectiveness of medical procedures, the unique needs of the elderly, languages of local patients, basic clinical procedures, and the ethical responsibilities of physicians. Students also called for teaching methods that encourage development of problem-solving and life-long learning skills, for departments to provide faculty with opportunities to improve their teaching skills and to give greater weight to teaching ability in the evaluation of faculty, for improved counseling of premedical students about the diversity of approaches to preparing for a medical career, and for national examinations to be criterion rather than norm referenced-based in the determination of who passes or fails.

The Administrative Board met before each Executive Council meeting to coordinate OSR activities and to formulate recommendations on matters under consideration by the Council. Of these, the OSR Board gave the greatest attention to development of AAMC's response to the GMENAC report, due process for house staff, moonlighting by residents, problems related to U.S. students studying medicine abroad, and the deliberations of the ad hoc External Examinations Review Committee. The Board nominated students to serve on AAMC committees and made its nominations for student participation on the LCME. The Board also discussed ways in which the Consortium of Medical Student Groups can more effectively meet its information-sharing and legislation-influencing goals. One project begun by the Board was the design of a survey to obtain information from medical school deans, faculty and students on what schools are doing to foster in students an awareness of their ethical responsibilities as physicians-in-training and as practitioners; this project will include an examination of the problem of unethical behavior during training.

During the winter the result of OSR's work on due process guidelines for medical students was mailed to student affairs deans, GME cor-respondents and OSR members; this mailing included an analysis of the policies regarding student grievances currently being used by schools and a set of model guidelines for adaptation by schools should they wish to modify theirs. One issue of *OSR Report* titled "Facing the Challenges of the Physician Manpower Scenario" was mailed to all U.S. medical students; this issue offered an overview of federal support for medical education, physician manpower studies, programs designed to improve distribution, and the implications of the presently available information for medical students as they develop their career plans.

National Policy

During the past year, national policy has focused virtually exclusively on the issue of federal expenditures and revenues. Single-minded concern with domestic fiscal policy dominated the final actions of the now defunct 96th Congress as well as those of the fledgling 97th Congress. In broad strokes, the behavior of the legislative and executive branches of government in the early 1980s was characterized by growing support for retrenchments in federal spending on domestic initiatives.

Last fall the 96th Congress was understandably preoccupied with the November elections; consequently much of its work was delayed until the outcome of that contest was assured. The new Administration headed by President Ronald Reagan was deeply dedicated to a conservative philosophy regarding the scope and role of the federal government. The guiding force behind the policies of the new Administration was predicated on reductions in government spending and taxation, elimination of unnecessary or reformation of overly burdensome regulations, and encouragement of a consistent monetary policy.

Traditional processes for appropriations and continuing budget resolutions, as well as a relatively untested one called reconciliation, became the focus for Congressional, and thus the Association's, concern as devices for responding to vocal and mounting public concern about the prevalence of double-digit inflation. But ultimately, it was the new President's ability to persuade Congress to accept his economic program that produced sweeping transformations in federal spending and taxation policy.

On the appropriations front the increasingly common practice of funding health programs through a continuing resolution did not present any real difficulties until 1980 when three separate resolutions were required. The First Continuing Resolution provided FY 1981 funding only until December 15, 1980, for health research, education and service delivery programs at the lower of their present level or the House adopted level. The Second Continuing Resolution also stopped short of providing funding authority for the remainder of the fiscal year. The conferees set June 5, 1981, as the expiration date of the resolution because that was believed to be the approximate point at which federal spending would exceed the agreed upon ceiling.

Concerns about FY 1981 spending were exacerbated when President Carter submitted to the Congress his FY 1982 budget, which included substantial rescission requests for the fiscal year in progress. Moreover, the Reagan Administration lost no time in embellishing upon the previous submission, in most instances recommending much lower FY 1982 appropriations for domestic initiatives, and more severe FY 1981 rescissions for programs of paramount concern to the Association's constituents. Biomedical and behavioral research and research training, student assistance, institutional support and veterans medical programs were especially hard hit by the new rescission requests.

Rescission legislation, a bill that proposed cancellation, in whole or in part, of budget authority previously granted by Congress, together with consideration of a Third Concurrent Budget Resolution for FY 1981 and a First Concurrent Budget Resolution for FY 1982 proceeded on virtually identical schedules.

The Association, concerned with the immediate impact of the proposed rescissions, testified against these retrenchments before both Senate and House appropriations subcommittees as well as before committees concerned with veterans programs; testimony highlighted the potentially devastating impact the Administration's proposals would have on research, research training, medical education and VA health care and research. By June, the House and Senate concurred on a Third Continuing Resolution for FY 1981 that contained $14.3

billion in rescissions. The agreement embodied provisions which eliminated support for capitation, put a severe crimp in research and training programs administered by the Alcohol, Drug Abuse and Mental Health Administration, reduced by a small margin support for the NIH and for student assistance, but did not impair VA health care programs.

Against the backdrop of the FY 1981 rescissions controversy, the Congress was also considering the FY 1982 budget. The 1974 Budget and Impoundment Control Act established the procedures and a timetable for Congressional actions related to overseeing and controlling federal expenditures and revenues. The new Administration proved to be exceptionally adroit in employing the authorities embodied in this largely untested statute to achieve fiscal retrenchments.

Last year, in acting on the First Concurrent Resolution on the budget for FY 1981, the Congress broke tradition and agreed to carry out reconciliation in conjunction with the spending targets described in that legislation rather than postponing it until the binding Second Concurrent Resolution was enacted late in the budget process. Despite an initial display of enthusiasm, the Congress failed to effectively combine reconciliation with the First Concurrent Budget Resolution.

In the new Congress the House and Senate set to work with determination to fashion budget resolutions for FY 1982 and what remained of FY 1981.

The Senate majority was fully in accord with the President's final proposals and took the lead on budget issues, explicitly acknowledging that its bills "represented a dramatic change in government spending policies."

The House adopted similar targets in May in what proved to be the first in a series of budget battles in which the Administration would emerge victorious. Initially the House majority sought to counter the President's spending policies and thus, championed a bill that was more sparing of domestic programs than that enacted by the Senate. However, a solid House minority joined ranks with a small group of southern Democrats to defeat the more liberal measure and to enact in its stead the proposal championed by the Administration. This controversy marked the first appearance of the coalition of conservative southern Democrats that would consistently support the Administration. The Congress then began to implement the reconciliation instructions contained in the newly agreed upon First Budget Resolution. The reconciliation instructions called upon virtually all committees to revamp the programs under their purview to achieve specified levels of savings. The discretionary and entitlement health programs of paramount concern to medical centers were endangered as a consequence of the zeal of the Congress to abruptly curtail federal spending.

The work on reconciliation proceeded less smoothly in the House than in the Senate. In the House Committee on Energy and Commerce, the parent committee for most health programs, partisan disputes deadlocked approval of action by both Subcommittee and full Committee, and two versions of the required reconciliation legislation emerged. One, embodying Chairman John Dingell's proposals, was endorsed by the AAMC; the other strongly reflected OMB influence. When the Committee failed to reach accord on either version, the choice was deferred to the full House membership. On the House floor a bitter partisan battle was waged over reconciliation legislation with the ultimate adoption of an alternative and more austere reconciliation bill backed by the Administration. However, the final package included the more generous health provisions that the Association had endorsed.

Conferencing the House and Senate reconciliation bills proved to be especially difficult in the area of health, but on balance, the agreement that emerged preserved support for the programs of central interest to the AAMC's constituents. The final reconciliation package approved by the Congress went beyond strictly budgetary matters, and functioned as a vehicle for reauthorizing the health manpower and research training legislation that had been mired in a seemingly irresolvable Committee deadlock. Moreover, entitlement programs such as Guaranteed Student Loans and Medicare and Medicaid were affected by the reconciliation efforts and emerged visibly, and perhaps permanently, altered.

Health manpower proposals had been approved by both chambers during the 96th Congress, but House and Senate conferees were never able to reconcile their divergent views to produce a consensus bill.

In the 97th Congress manpower programs came under early attack via rescission requests. Specifically, the new Administration requested the abolition of the capitation and the Health Professions Student Loan programs, and abridgements of Family Medicine Training and General Medicine and Pediatrics programs. With the exception of capitation, the Congress ultimately approved rescissions much less severe than those advanced by the Administration.

Reauthorization of the manpower programs surfaced on the Congressional agenda early in the year. The Association testified on both sides of the Hill, stressing that federal participation in the medical education enterprise represents an appropriate and important utilization of federal resources.

The Senate Labor and Human Resources Committee reported manpower legislation in early May (S.799). The bill called for significant alterations in and dissolution of a number of manpower programs, and advanced spartan authorization ceilings for the remaining activities. The most troublesome aspect of S.799 was its very limited provisions for student assistance.

In the House, renewal of health manpower programs became entrained with, and ultimately resolved through, the reconciliation process. Although manpower legislation had been introduced and hearings convened, the responsible subcommittee had failed to formally report a bill. As Congress became embroiled in the process of slashing programs in accordance with reconciliation directives, it was decided to reauthorize the manpower program through that process, and the bill developed by Subcommittee Chairman Henry A. Waxman was incorporated into the reconciliation bill enacted by the House in late June.

Resolution of the divergent health manpower provisions of the two chambers proved difficult because the Senate approach to program reductions involved capping appropriations levels while the House measure, which prevailed, urged the conferees to reauthorize the manpower statute through the reconciliation process at the higher funding levels.

Much like the health manpower programs, the National Research Service Award program of NIH and ADAMHA came under sharp attack by the new Administration. A rescission proposal entailed eliminating institutional allowances and indirect cost reimbursement, both vital components of the programs, and reducing the number of trainees by 788 to a total of 10,000 for the NIH. The Association's testimony strongly defended the importance of the biomedical research training enterprise and emphasized the essentiality of institutional support and indirect costs to the quality of that endeavor. Both HHS Appropriations Subcommittees proved to be strong advocates of biomedical research training. The approved reductions in the research training amounted to less than 20 percent of the Administration's original proposals and the provision for institutional support and indirect costs was strongly endorsed in the reports accompanying the bills.

Unlike most of the programs operated under the auspices of the NIH, the NRSA program requires periodic reauthorization and legislative action was needed before September 30, 1981. Along with NRSAs, the committees also included considerations of Medical Library Assistance and the National Centers for Health Statistics, Health Care Technology, and Health Services Research, dubbing the measure an "omnibus health" bill.

During the Senate's hearings, the Association emphasized the importance of reversing the decline in the number of physicians entering research training and stabilizing federal support for biomedical research training. The important contributions that reimbursements for indirect cost and institutional allowances make to sustain the high quality of biomedical research training programs were also highlighted. The Association also objected to provisions in the Senate bill that compromised three medical library assistance grant programs and the National Centers. The Labor and Human Resources Committee never reported a bill, as the measure became deadlocked in Committee.

In early June the House convened a markup for its omnibus health bill. The House markup also deadlocked. At that point a decision was reached to try to include the bill in the House's reconciliation package.

In lieu of incorporating the Senate omnibus health bill in that chamber's reconciliation legislation, Senate Committee Chairman Orrin Hatch inserted both authorization ceilings for NRSAs and an overall cap on NIH appropriations, together with an explicit assumption that an omnibus health bill would be enacted later in the year. Again, Senate and House proposals were deeply divergent. In the reconciliation conference, the issue was resolved quite rapidly with the conferees agreeing to reauthorize the National Research Service Award program for two years at amounts closer to the higher House-passed figure, and to retain the current statutory provision mandating institutional support components for the awards.

While the outcome was, in general, better than might have been expected, future amounts of research training support are sure to be somewhat less than currently provided. Report language accompanying the conference bill clearly states that the final balance between numbers of trainees and levels of institutional support is to be determined by HHS under the general guideline that the number of trainees be near that currently supported and that the level of institutional support be close to that now provided. In addition, all current authorities for medical library assistance were retained and all three of the National Centers were reauthorized for three years.

Assistance programs for post-secondary school students also fell victim to the reconciliation retrenchments despite the fact that legislation renewing and revising these programs had been enacted only a few months earlier.

Of particular concern was the reauthorization of the Guaranteed Student Loan program, the major source of assistance to medical students, in the 1980 Higher Education Act renewal. The 1980 statute raised the interest rate for loans to new borrowers under this program to nine percent from the prevailing level of seven percent. In addition it increased the total borrowing limit for undergraduate and graduate education, granted discretionary authority to increase the borrowing limit applicable to graduate and professional students pursuing programs deemed "exceptionally expensive," permitted deferral of repayment for a two-year period for borrowers serving internships required for professional practice, and decreased the prevailing 9–12 month grace period before repayment to 6 months. Finally, the law contained a particularly desirable provision permitting the consolidation of certain loans, unfortunately specifically nullified by later legislation; had it not been repealed, it would have proved extremely beneficial for medical students with the higher interest rate HEAL loans.

Reducing the cost of the GSL program emerged early as a priority of the new Administration, and Congress sought to reduce the scope of the program through the reconciliation process. The final accord reached on the GSL program was somewhat more generous than that initially advanced by either the House or the Senate. It limited eligibility to students with adjusted gross family incomes of $30,000 or less and, for higher income families, to applicants able to document need. The conferees also agreed to require all students to pay a 5 percent origination fee upon receipt of their loans. The final version retains all periods of deferral now embodied in current law, including the two-year deferral for "internships."

The final version of the reconciliation bill addressed five Medicare items of particular interest to AAMC members. Positions advocated by teaching hospitals were adopted on two issues. Conferees agreed to omit the proposal requiring that interest earned on funded depreciation be offset against interest paid on capital indebtedness, and to modify the prospective renal dialysis rate. On two other issues conferees reached an accord on provisions which imposed a significant payment reduction on hospital services by requiring that the general inpatient routine service cost limits be set at no more than 108 percent of the group mean (presently 112 percent), and that a new payment limitation on the costs of hospital and clinic-based out-patient visits, excluding emergency room visits, be established based on charges of physicians for comparable office visits. Both of these payment limitations will have particularly adverse impacts on teaching hospitals. Finally, conferees agreed to reduce the present 8.5 percent Medicare nursing differential to 5 percent.

In terms of the Medicaid program, despite considerable pressure by the Administration, the conferees rejected all proposed versions of a cap, instead reaching consensus to reduce the projected federal payment for the Medicaid program by 3 percent in FY 1982, 4 percent in FY 1983, and 4.5 percent in FY 1984.

Action on a number of other national policy issues of concern to the Association's constituents occurred outside the reconciliation process. Legislation to reorganize the National Institutes of Health and to revamp the funding mechanism for biomedical research occupied much of the time and energy of AAMC staff during the 96th Congress. Although both chambers passed bills by overwhelming margins, the conferees were unable to reach agreement on a consensus measure. Particularly troublesome were proposals embodied in both measures that would have established authorization ceilings and short-term authorities for each of the institutes. Several items initially incorporated into the biomedical research bills were enacted. The final legislation contained a series of miscellaneous provisions that reauthorized the National Cancer Institute and the National Heart, Lung and Blood Institute until the end of fiscal year 1982, renamed the National Institute of Arthritis, Metabolism and Digestive Diseases as the National Institute of Arthritis, Diabetes and Digestive and Kidney Disease, provided for training stipends from Diabetes Research and Training Centers and Multipurpose Arthritis Centers funds, established a Digestive Diseases Advisory Board, and required HHS to contract with the Institute of Medicine for a review of previous and ongoing neurological research and to outline a five-year plan for further research. Although specific biomedical research legislation has not yet emerged in the 97th Congress, Senator Hatch recently proposed to place an authorization ceiling on the NIH appropriations. The rationale for the proposal was to assure that FY 1982 spending levels for the NIH did not exceed the Administration's recommendations. Some observers view the proposal as a prelude to the resumption of consideration of legislation similar to that proposed in the last Congress.

The Congress voted overwhelmingly on August 27, 1980, to override President Carter's veto of legislation to revise and make permanent the authority of the Veterans Administration to enter into special pay agreements with physicians and other health professionals employed by the VA's Department of Medicine and Surgery. This law considerably improved the current situation by providing substantial increases in bonus pay and more favorable retirement benefits. Despite early assurances by the new Administration that the budget of the Veterans Administration would not be subject to funding reductions, the Reagan budget recommended large cuts in important VA programs including those authorized by this law. The Association registered its protest to these proposals in appearances before the relevant Appropriations Subcommittee as well as a special House Budget Subcommittee. In the final analysis, the Congress largely ignored the Administration's recommendation and provided the funds necessary to implement the physician pay bonuses and denied virtually all the rescission requests directed at VA medical care programs.

Measures requiring that 10 to 15 percent of the research and development budgets of federal R&D agencies be spent with small business firms were introduced in the 96th Congress and, in more modest (1 percent set-aside) forms, into the 97th; one, in particular, has received wide support. The proposal, advanced in identical Senate and House bills, most disturbing to the Association, mandates that one percent of the R&D budget of major research agencies be sequestered for grant and contract awards to small businesses. Essentially, the legislation would circumvent the traditional policy of awarding funds on the basis of the technical merit of the work proposed and competence of the performer.

Despite the fact that the various bills designed to promote "humane" research methods were not subject to action in the 96th Congress, similar measures have been reintroduced this year. The issues at stake involve fund set-aside for developing research and testing methods alternative to those involving live animals, mandatory adoption of alternative methods of demonstrated validity, and prohibition on the use of federal funds for "duplicative" research involving live animals.

The Department of Health and Human Services and the Food and Drug Administration published separate sets of regulations governing the activities of Institutional Review Boards and the protection of human research subjects in January 1981. The final rules, while not completely satisfactory from the Association's perspective, represent a substantial improvement over the proposed regulations issued in August 1979. Of particular concern in these proposals were inconsistencies between the two policies, the imposition of scientific review functions on IRBs and the establishment of burdensome paperwork requirements. Generally, the Association was satisfied with the HHS proposal, but encountered serious problems with the FDA proposition. A review of the final rules indicates that many of these problems were eliminated or at least mitigated, although troubling disparities remain in the areas of assurances, inspections, sanctions and confidentiality.

Working with Other Organizations

Last year the five parent organizations of the Coordinating Council on Medical Education — the American Board of Medical Specialties, the American Hospital Association, the American Medical Association, the Council of Medical Specialty Societies, and the AAMC — agreed to reorganize the CCME. In 1981 the new Council for Medical Affairs met for the first time. Unlike the CCME, the CFMA does not have a coordinating role over accreditation activities, but it does provide an opportunity for these similar but diverse associations to discuss issues affecting medical education. With each parent organization naming its top two elected officers and its chief executive officer as its representatives, the CFMA has become a valuable forum for the exchange of ideas and opinions, and has fostered cooperative activity in several important areas.

Since 1942 the Liaison Committee on Medical Education has served as the national accrediting agency for all programs in medical education leading to the M.D. degree. The LCME is sponsored by the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges. Prior to 1942, and beginning in the late nineteenth century, medical schools were reviewed and approved separately by the AAMC and the AMA. The LCME is recognized by the physician licensure boards of the 50 states and U.S. territories, the Canadian provinces, the Council on Postsecondary Accreditation and the Department of Education.

The accrediting process assists schools of medicine to attain prevailing standards of education and provides assurance to society and the medical profession that graduates of accredited schools meet reasonable and appropriate national standards; to students that they will receive a useful and valid educational experience; and to institutions that their efforts and expenditures are suitably allocated. Survey teams provide a periodic external review, identify areas requiring increased attention, and indicate areas of strength as well as weakness. The findings of the LCME have been used to establish national minimal standards by universities, various government agencies, professional societies, and other organizations having working relationships with physicians.

The LCME, through the efforts of its professional staff members, provides factual information, advice, and both informal and formal consultation visits to newly developing schools at all stages from initial planning to actual operation. Since 1960 forty-one new medical schools in the United States and four in Canada have been accredited by the LCME.

In 1981 there are 126 accredited medical schools in the United States, of which one has a two-year program in the basic medical sciences and four have not yet graduated their first classes and consequently are provisionally accredited. The 122 schools that have graduated students are fully accredited. Additional medical schools are in various stages of planning and organization. The list of accredited schools is found in the *AAMC Directory of American Medical Education*.

A number of new medical schools have been established, or proposed for development, in Mexico and various developing island countries in the Caribbean area. These entrepreneurial schools seem to share a common purpose, namely to recruit U.S. citizens. There is grave concern that these are educational programs of questionable quality based on quite sparse resources. While the LCME has no jurisdiction outside the United States and its territories, the staff has attempted to collect information about these new schools and to make such data available, upon request, to premedical students and their collegiate advisors.

On January 1, 1981, the Liaison Committee on Graduate Medical Education was transformed into the Accreditation Council for Graduate Medical Education. This change, which grew out of discussions held by the five sponsors in the newly formed Council for Medical Affairs, was accompanied by an increase in membership from two to four each for both the American Hospital Association and the Council of Medical Specialty Societies. The ACGME now has 20 members appointed by the sponsors, a public member, a resident member, and a non-voting federal representative.

The financing of accreditation activities for graduate medical education was also changed. A $25.00 a year charge for each resident was levied in addition to charges for accreditation surveys. During 1981 the AMA continued to support the ACGME by underwriting any deficits during the transition toward financial independence. Beginning December 1, 1981, the ACGME is expected to generate sufficient income to support all accreditation activities. The activities of the ACGME that relate to policy development will be financed by the five sponsoring organizations.

The bylaws of the ACGME require that staff services for the ACGME be provided by one of the five sponsors under the terms of a written memorandum of understanding. A subcommittee of the ACGME has met with AMA representatives to negotiate a memorandum with that organization. It is anticipated that a memorandum of understanding, to become effective December 1, 1981, will be approved by ACGME and its sponsors.

The ACGME has been empowered to authorize residency review committees to accredit graduate medical education programs under terms and conditions specified by the ACGME. Several RRCs have indicated a desire for such authority. Policies and procedures to delegate accreditation authority to requesting RRCs have been developed.

Other notable actions by ACGME this year were the ratification of the revised General Requirements Section of the Essentials of Accredited Residencies by all sponsors, the establishment of a process to implement accreditation of sub-specialty graduate medical education programs, and the initiation of procedures to accredit one year transitional programs.

At its May meeting the ACGME, after hearing a preliminary report of the AAMC's External Examinations Review Committee, requested a study committee review of the examination methods and eligibility standards currently employed by the Educational Commission for Foreign Medical Graduates for certifying graduates of non-LCME accredited medical schools for entry to accredited graduate medical education programs in this country.

In January 1981 the newly constituted Accreditation Council for Continuing Medical Education succeeded the Liaison Committee on Continuing Medical Education with the full participation of all original LCCME member organizations. This welcome reunification of the accreditation mechanism was carried out without difficulties. The new Council immediately undertook the task of completing a set of Essentials which had been under preparation by the previous organizations. After review and feedback by member organizations the ACCME approved the new Essentials in June and sent them to member organizations for approval.

Once these Essentials are approved, the Council will develop a companion handbook as a guide for the continuing education provider seeking accreditation and for the surveyors reviewing provider organizations and institutions. The handbook will take account of the multiple settings of CME represented by the various provider organizations and institutions.

Presently the ACCME is using a reverse site visit procedure for the re-accreditation review with the intent of assessing critically this review mechanism after one or two years of operation.

The Educational Commission for Foreign Medical Graduates continues to offer its examination for certification requirements of graduates of foreign medical schools, either U.S. citizens studying abroad or aliens with permanent residency in the U.S. All alien FMGs who require an entry visa must sit for the Visa Qualifying Examination developed by the NMBE and administered by the ECFMG. Despite a considerable decline in alien FMGs, the number of candidates for the ECFMG examination decreased in 1978 only temporarily to increase again due to the larger number of U.S. citizens studying medicine abroad and seeking admission to U.S. graduate medical education programs or to Fifth Pathway programs. An ECFMG Invitational Conference in October discussed issues of equivalency of education and examination. The ECFMG is also sponsoring a grant program supporting research and development in optimizing an FMG's educational experience in the U.S. graduate programs. A new scholarship program has also been approved for support of basic scientists who wish to gain teaching experience in U.S. medical educational institutions.

The Association worked closely with the NRMP in its revision of the Resident Matching Program for 1982. The revised match will permit students to be matched into programs that begin in the first graduate year and in later years. When fully adopted by teaching hospitals and program directors, the provisions of the new match should reduce pressures on students to make premature decisions to enter graduate medical education programs in certain specialties.

At the Association's request, the NRMP printed and distributed the Universal Application Form for Graduate Medical Education which had been developed after two years of study. The form was distributed to medical students at their schools for their use for applying to graduate medical education programs. The experience with the form in its first year of use will be studied to determine whether the distribution to students through their schools is an effective way to gain its acceptance by teaching hospitals and program directors.

This year the proposal by the Federation of State Medical Boards to establish a single route to licensure by requiring the passing of a two part Federation Licensing Examination sequence came under close scrutiny, and the Association's Executive Committee has met with Federation representatives to discuss their concerns.

The Coalition for Health Funding, which the Association joined with others in establishing 11 years ago, has expanded its activities and influence by monitoring and commenting on the development of the Congressional budget resolutions in addition to the traditional efforts on the appropriation process. The unpredictabilities in the evolution of the Congressional reconciliation process presented new challenges to the Coalition and emphasized the importance of cooperation with other organizations with similar interests. Efforts continue to refine the process by which the Coalition recommendations are developed and disseminated. Widespread acknowledgement of the usefulness of the Coalition's annual position on appropriations for the discretionary health programs offers significant evidence of the increasing respect in which the Coalition is held.

The diversity of the Association's interests and the nature of its constituency offers an unusual opportunity for liaison with numerous other organizations representing health care providers, higher education and those interested in biomedical and behavioral research. The Association is regularly represented in the deliberations of the Joint Health Policy Committee of the Association of American Universities/American Council on Education/National Association of State Universities and Land-Grant Colleges and in the Intersociety Council for Biology and Medicine. These liaison activities provide forums in which information on matters of national interest can be shared, varying points of view can be reconciled and collective actions undertaken in the area of federal legislation and regulation.

As a member of the Federation of Associations of Schools of the Health Professions, the AAMC meets regularly with members representing both the educational and professional associations of other health professions. This year FASHP has been especially concerned about health manpower legislation and budget and appropriations allocations for health manpower programs.

The Executive Committee of the Association met twice with their counterparts at the Association of Academic Health Centers. Among the agenda items at these meetings were the AAMC's new study on the General Professional Education of the Physician and the AAHC project to examine the impact of the federal budget on academic health centers.

Education

Various pressures during the last five to 10 years have focused attention on the need to assess the direction and effectiveness of our education systems. In elementary and secondary education concern about the impact of "innovative" educational philosophy and practice prompted a call for a "return to the basics." In no small way a continuing decline in the standardized test scores of graduating high school seniors was responsible for raising the alarm. The dwindling supply of public monies available during recent years to support education has placed increased emphasis on selectivity in the allocation of educational resources. This is clearly evident, for example, from reviewing recent tax support for medical education which has imposed more conditions relating to social goals to qualify for such support. Certain groups found education to lack appropriate moral fiber and have pressed for the reintroduction of spiritual values into the educational environment. In short, a variety of forces have combined to suggest a rather comprehensive reassessment of our educational mission and strategies at all levels.

In line with this trend, and having just completed an in-depth study of graduate medical education resulting in the report, *Graduate Medical Education: Proposals for the Eighties*, the AAMC has embarked on a major new venture involving a comprehensive examination of the post-secondary educational experiences preceding graduate study. Supported by a major grant from the Kaiser Family Foundation, the Association has initiated a three-year project to review and appraise the general professional education of the physician and college preparation for medicine to determine how education to the level of the M.D. degree can more effectively prepare students for their specialized education during graduate medical education and for lifelong professional learning. Under the direction of a special panel the project will involve institutional faculties and academic societies at medical schools and undergraduate colleges. The project is timely because it is now acknowledged that baccalaureate education and undergraduate medical education comprise the general preparation for a medical career. At a time when educational resources are limited, it is appropriate that faculties appraise their programs and determine how they can better accomplish their educational mission.

The Group on Medical Education has concentrated major attention on both of these areas in the development of its programs. Continuing a cooperative effort started in 1980, the GME coordinated an annual meeting program on house staff evaluation with the Association of Program Directors of Internal Medicine and the Society of Teachers of Family Medicine. This session combined the perspectives of those two specialties with that of surgery and also included an overview based on information collected for the AAMC Clinical Evaluation Project. The possibilities suggested by this combined interest for a more enduring form of assistance to graduate faculty are under active consideration.

The GME has also set in motion a phased effort to identify and analyze the issues it thinks merit consideration in the study of the General Professional Education of the Physician.

Another subject receiving particular attention at each GME Regional Meeting was the status of the Comprehensive Qualifying Examination under development by the National Board of Medical Examiners and its relationship to the proposal by the Federation of State Medical Boards for a FLEX I/FLEX II licensure process. The level of concern and interest generated in these meetings led to a 1981 annual meeting plenary session with the Group on Student Affairs. This session entitled, "The External Examination Dilemma: Impact on Student Behavior and Educational Programs," was viewed as an important step in encouraging informed faculty consideration of these issues and of the report of the AAMC ad hoc Committee on External Examinations Review.

The Clinical Evaluation Project continued to provide valuable data. In addition to its importance for the GME/APDIM/STFM session, it served as the basis for presentations to the January 1981 AAMC Residents Conference and the CAS Interim Meeting. The report series from the program is also now available. Information received from clinical faculty from approximately 500 departments is analyzed in terms of issues and problems surrounding evaluation of clerks and residents. Specialty-specific data are available for internal medicine, pediatrics, surgery, psychiatry, obstetrics-gynecology, and family medicine. The report series will serve as stimulus documents for three workshops which will provide a forum for faculty to address evaluation issues with regard to particular departmental needs. The Resident Conference itself was a useful forum for eliciting the views of senior residents on current evaluation practices in graduate medical education and for sharing these perceptions with key representatives of organizations with graduate education responsibilities.

The MCAT Interpretive Studies Research Program now provides a wide range of data to assist member schools in their use of MCAT score information. Cooperative validity studies with 27 schools are in progress; each is concerned with the relationship between the scores used in admissions and performance in medical school. Summaries of findings with regard to basic science performance are expected in the coming year. AAMC staff also disseminate research results on the national group of MCAT examinees through the MCAT interpretive studies series.

To assure that after five years the New MCAT science content is still current and necessary as a prerequisite to the study and practice of medicine, the AAMC is undertaking a limited review of the test's science content. The review for relevance as a prerequisite will be accomplished by 150 selected medical school faculty, while the currency of the science material will be assessed by undergraduate college science faculty.

While these necessary and productive activities are being implemented to support the admissions testing program, it continued to be necessary to dedicate significant attention to the problem posed by the threat of federal and state legislation to regulate standardized testing. At joint hearings of the House Subcommittees on Elementary, Secondary, and Vocational Education and Post-Secondary Education little new support for the legislation was in evidence, but professional organizations of testing specialists found an opportunity for the first time to voice their opposition in such a forum. Interest at the state level declined somewhat as reflected by the number of legislatures scheduling actions. Their review during the first half of 1981 failed to produce any new legislation. Meanwhile, the AAMC continues to offer the MCAT in New York under the protection of a preliminary injunction issued by a Federal District Court in New York while the constitutionality of the New York law is being reviewed.

The Continuing Education Systems Project initiated jointly with and supported by the Veterans Administration has completed the formulation of criteria for continuing education in the health professions incorporating the concepts of the adult professional as an independent learner into a set of institutional responsibilities for program planning and implementation. In close collaboration with the Regional Medical Education Centers and selected Learning Resource Centers of the Veterans Administration, the project is now developing a management and reporting system for continuing education and learning packages aimed at facilitating the application of these principles to the day-to-day operation of continuing education units in health profession schools and organizations. To test the validity of these concepts and of the criteria, the project has established close working relationships with a number of institutions and organizations including the Center for Educational Development at the University of Illinois, the Office of Research and Development for Education in the Health Professions at the University of North Carolina, the Office of Continuing Medical Education at Temple University and its affiliated hospitals, the American College of Physicians, the American Hospital Association, the Accreditation Council for Continuing Medical Education, the California Medical Association, and the Committee on Continuing Education of the American Dental Association. While the project is limited to the quality of continuing education per se, ultimately the goal is to assess the impact of educational intervention on the quality of health care rendered.

Another aspect of the continuing interest of the Association in assisting the promotion of quality in the educational process has been the involvement in the development of AVLINE (audiovisuals-online) as a mechanism for increased sharing of quality educational materials. Considerable effort has been expended towards developing criteria for acceptable quality of audiovisual educational materials, criteria which could guide the production as well as the critical assessment of such materials. With the assistance of the National Library of Medicine, the Educational Materials Project of the Association is promoting the concept of enhanced responsibility of the producer for quality of their productions and for the information needed to increase their potential usefulness in the instructional process.

Biomedical and Behavioral Research

Significant changes in the political and economic climate affecting biomedical and behavioral research, occurring simultaneously with increased evidence of the great potential or practical applications of new research findings, epitomized a paradox of unusual promise but profound uncertainty. The outgoing President proposed substantial rescissions in the appropriations for fiscal year 1981 for the National Institutes of Health and the research activities in the Alcohol, Drug Abuse and Mental Health Administration, along with budgetary proposals for fiscal year 1982 substantially below those required to maintain program levels. Subsequent events involved an almost bewildering array of funding proposals and counter-proposals as well as major modifications in the legislative process as the new Administration inexorably pressured Congress for adoption of its economic strategy. "Reconciliation" assumed sudden importance as a new term in the lexicon of scientists, and the outcome of Congressional battles concerning energy and transportation became highly important because of the peculiarities of legislative packaging. In part, because of strenuous efforts on its behalf but also because of fortuitous events, biomedical research fared comparatively well, both as far as proposed rescissions for FY 1981 and appropriations for FY 1982. Additionally, the National Research Service Award authority on which research training programs are dependent was renewed with several favorable features, especially as compared with initial proposals. Especially rewarding was the defeat of efforts to eliminate any possibility of institutional support as a part of training stipends. At the same time, the possibility of a worsening of the nation's economy and more drastic budgetary cuts in future fiscal years tempered a feeling of relief at the outcome of the legislative battles.

Despite the intense preoccupation of the Congress with economic issues, there were legislative proposals in other areas which could have significant impacts on biomedical and behavioral research. Particularly threatening were bills to establish dollar set-asides from the budgets of research-supporting agencies in order to exploit the putative capabilities of the country's small business to increase and improve "innovation." Along with other organizations, the Association vigorously criticized these proposals because the award of funds for research to small business firms would be outside the general competition with all other applicants based on scientific merit. Similarly threatening were proposals that would have required sequestration of substantial funds by NIH and other federal agencies to develop alternative methods to the use of animals in research.

More gratifying was the enactment of legislation that brought long-desired consistency to federal patent policy, including recognition of institutional patent agreements as a useful incentive for moving new discoveries into widespread application. There also were significant improvements in several pertinent regulations, prompted in part by the new anti-regulatory climate which developed after the last national election. Thus efforts to improve the regulations covering the disposal of radioactive wastes were largely successful. Changes by the National Institutes of Health in regulations governing research using recombinant DNA techniques represented similar advances, and the regulations governing the protection of human subjects in research were favorably modified after extensive negotiations in which the AAMC was involved. Unresolved, however, were the issues involving how the Occupational Safety and Health Administration would propose to regulate the use of toxic chemicals. Similarly persistent is the problem of time and effort reporting, an example of the difficulty in developing reasonable methods to demonstrate accountability for the use of federal funds. The subject of compensation for injured research subjects remains under consideration by the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, with a pilot study being considered to explore the feasibility of a compensatory mechanism.

Increased competition for available research funds led to further discussions within the federal government, especially at NIH, and within organizations such as the Association on the increasingly nettlesome problem of the allocation of funds between direct and indirect costs. Although no specific restrictions occurred, it was apparent that research-oriented faculties and both the Administration and the Congress were increasingly determined that the ratio of funds allocated to the two types of costs should be examined, if not controlled. Institution officials, meanwhile, sought new ways to convince the critics of the essentiality of those expenditures and the needs for adequate reimbursement as justified in the support of any research program.

Prompted by the potential apparent for both medicine and other fields, particularly agriculture, in the enhanced ability to manipulate genetic material, new commercial ventures were started by faculty members to exploit the scientific and commercial possibilities. Numerous institutions and other organizations began to explore the complex issues in order that the public would gain by proper and prompt applications of these techniques, individual faculty members would receive their just scientific and financial rewards, and the fiscal and substantive integrity of academic institutions could be preserved.

Growing concerns abounded about the ability of the NIH, ADAMHA, and the Veterans Administration to recruit and retain senior scientific and managerial leadership as the attractiveness of federal employment for such individuals decreased. For example, there were more vacancies at senior level positions at the NIH than ever before in its history. In large part, the continuation of unreasonable ceilings on federal salaries was responsible. Given the current mood of the Congress, it seems unlikely that this situation will improve in the immediate future. At the same time, it was apparent that the general nature of federal employment had become significantly less attractive at such levels. The sudden resignation of Donald S. Fredrickson as Director of NIH dramatized this problem.

Health Care

Interest in the development of health maintenance organizations at academic medical centers prompted the Association to cosponsor a national conference with the Kaiser Family Foundation in October 1980. The conference proceedings, available from the Kaiser Family Foundation, will include summaries of discussions on issues such as the cost of conducting educational programs in prepaid practices, the compatibility between the service objectives of prepaid practices and the educational and research objectives of academic medical centers, and the effect of prepaid practice on faculty plans. These summaries, the papers presented by the major speakers, and the case histories of academic medical center/prepaid practice affiliations provide many insights into successfully developing relationships between academic medical centers and prepaid practices.

Two books prepared by the Association under a grant from the Health Care Financing Administration focused on the teaching of quality assurance and cost containment. The major text, a resource book for faculty and curriculum planners, explores ways in which the teaching of quality assurance and cost containment can be incorporated into the medical school curriculum and residency programs and then evaluated. The history and future trends in this area also are addressed. The companion volume, intended for use by medical students and residents, provides an overview of the rationale, principles and methodology involved in learning about quality assurance and cost containment. It offers a detailed case study that illustrates a five-stage approach to the conduct of a quality assurance study and provides a series of exercises to test the reader's ability to comprehend and apply the learning material. The books are currently in publication.

In October 1980 the Association began a project on aging and long term care. Under a cooperative agreement with the Administration on Aging, the AAMC provides technical assistance to institutions with AoA grants to plan or operate multidisciplinary long term care gerontology centers. It is intended that these centers become a national resource for needed services, research, and education and training in long term care.

The Association's primary role is as a facilitator to the long term care centers and projects in obtaining their goals. The Association, therefore, promotes an exchange of information on programs and organization at each of the centers and projects, and provides the services of experts in organizational development and long term care issues to the new and advanced planning centers. In addition, the Association is developing a management information system that will collect, analyze, and report data on the accomplishments of the operational centers.

To ensure that the project activities incorporate the views and concerns of the many different disciplines involved in long-term care centers and projects, the Association established a multidisciplinary project advisory committee. The committee met in January 1981 to review AAMC's planned activities and to express their views on the major long term care issues to be addressed in the 1980s. Its October 1981 meeting will review progress to date, advise the AAMC of future directions, and discuss ways in which interest in long term care can continue to be fostered in the nation's academic medical centers.

The AAMC has also conducted workshops on organizational and program planning issues and specific substantive areas such as research on the impact of the environment on the frail elderly, training of professionals who supply long term care in different settings and at different levels of intensity, long term care policy analysis and assessment, and approaches to developing innovative models of service. A third workshop is scheduled for May 1982. The exchange of information on long term care is further enhanced by the publication of a newsletter on the LTCGC program.

Faculty

In response to an Executive Council concern and on the recommendation of the *ad hoc* Committee on Clinical Research Manpower, the Association conducted several studies pertaining to the supply, training and career-long research productivity of clinical investigators. The studies were performed under contract from the Commission on Human Resources of the National Academy of Sciences and are being published by the National Institutes of Health. One study surveyed the amount of time physician faculty spend in research and research-related activities and found characteristically different career profiles of research involvement and publication among academic physicians in different specialties. Medical and behavioral specialists publish at rates that are sustained as their careers advance, while publications profiles of surgical and hospital-based specialists peak and then decline after about age 45. Published output from physicians in basic science departments peaks early and rises again later in their careers. By combining these profiles, assumptions regarding training and growth of faculty, and age-specific rates of faculty hiring and loss, total publication output can be projected.

Another study performed for the National Academy of Sciences compared the careers of physicians who received research training through four alternative programs: NIH postdoctoral fellowship training, the NIGMS medical scientist training program (MSTP), and the NIH research and clinical associates programs. All four programs were highly successful in producing physician scientists, but the MSTP was the most successful. MSTP graduates are more likely to continue their research involvement, publish more, and rise faster through the faculty ranks than the other three matched groups of physicians.

A third study examined whether there has been a change in successive graduating classes of MDs in the fraction who join medical school faculties. Using the Faculty Roster System to examine the classes of 1967 through 1974, it was found that, aside from variability in the early years after graduation, about 15 percent of each class had joined faculties within nine years of graduation. An anticipated declining trend was not observed. It was also noted that female graduates join faculties sooner and in greater proportions than do their male counterparts.

The rising numbers of faculty position vacancies in clinical departments, a cause of some recent alarm, was found to be proportionally matched by growing vacancies in basic science departments. Further studies, now in progress, examine whether PhDs are increasingly hired to fulfill research roles in clinical departments.

The Faculty Roster System, initiated in 1965, continues to be a valuable data base, containing information on current appointment, employment history, credentials and training as well as demographic data for all salaried faculty at U.S. medical schools. In addition to supporting AAMC studies of faculty manpower, the system provides medical schools with faculty information for use in the completion of questionnaires for other organizations, for the identification of alumni now serving on faculty at other schools, and for production of special reports.

The Faculty Roster supports a variety of manpower studies, including an annual descriptive study, funded in part by the National Institutes of Health. In 1980, *Trends in Medical School Faculty Characteristics, New Faculty and Continuing Faculty—1968–78,* was published. This report differs from previous faculty descriptive studies in its comparison of characteristics of newly hired faculty to existing faculty characteristics.

As of June 1981 the Faculty Roster contained information for 57,929 faculty; an additional 34,732 records are maintained for "inactive" faculty, individuals who have previously held a faculty appointment.

The Association maintains an index of

women and minority faculty, based on the Faculty Roster, to assist medical schools and federal agencies in their affirmative action recruiting efforts. The Faculty Roster staff has responded to 180 recruitment requests from medical schools by providing the records of selected faculty meeting the requirements set by the search committees. The faculty records utilized in this service are only those for which consent has been received from the individual faculty members.

The Association's 1980–81 *Report on Medical School Faculty Salaries* was released in February 1981, presenting compensation data for 118 U.S. medical schools and 31,712 filled full-time faculty positions. The tables present compensation averages, number reporting and percentile statistics by rank and by department for basic and clinical sciences departments. Many of the tables also allow comparisons according to type of school ownership, degree held, and geographic region.

Students

As of August 1981, 36,497 applicants had filed 337,075 applications for the entering class of 1982 in the 126 U.S. medical schools. These totals, although not final, already surpassed the final figures for the entering class of 1981.

First-year enrollment increased from 16,930 in 1979–80 to 17,186 in 1980–81 while total enrollment rose from 63,800 to 65,189. This increase represents the smallest growth in enrollment in the past five years; however, the actual number enrolled establishes a new record. A portion of the increase is attributable to a rise in the number of all minorities enrolled since 1979–80. However, the number of underrepresented minority students enrolled remains virtually unchanged since last year.

First-year enrollment of women medical students reached 4,966, a 5.4 percent increase since 1979–80, while the total number of women enrolled was 17,248, a 6.9 percent increase. In 1980–81 women constituted 28.9 percent of the first-year class and 26.5 percent of all medical students.

The application process was facilitated by the Early Decision Program and by the American Medical College Application Service. For the 1981–82 first-year class 958 applicants were accepted by the 62 participating medical schools. Since each of these applicants filed only one application rather than the average of 9.2 applications, the processing of approximately 7,850 multiple applications was avoided. In addition, the program allowed the successful early decision applicants to finish their baccalaureate programs free from concern about admission to medical school.

Ninety-seven medical schools used AMCAS to process first-year application materials for their 1981–82 entering class. In addition to collecting and coordinating admission data in a uniform format, AMCAS provides rosters and statistical reports and maintains a national data bank for research projects on admission, matriculation and enrollment. The AMCAS program is guided in the development of its procedures and policies by the Group on Student Affairs Steering Committee.

The Advisor Information Service circulates rosters and summaries to AMCAS applicants who have authorized the release of personal information to their health professions advisors. In 1980–81, 209 health professions advisors subscribed to this service.

During each application cycle, the AAMC investigates the application materials of a small percentage of prospective medical students with suspected irregularities in the admission process. These investigations, directed by the AAMC "Policies and Procedures for the Treatment of Irregularities in the Admission Process," help to maintain high ethical standards in the medical school admission process.

The number of Medical College Admission Test examinees for 1980 and the projected total for 1981 appear to indicate a general slowing of the rate of decrease in the number of MCAT examinees evidenced over the past five years. With the exception of the artificial increase in the number of examinees in 1977 because of the introduction of the New MCAT, decreases in the number of MCAT examinees between 1975 and 1979 were of the magnitude of 2500-3000 examinees per year. This is contrasted with a 3 percent increase in 1980 over 1979 and a projected return to 1979 levels for the two administrations in 1981. While the total number of examinees appears to be stabilizing, the percentage of women examinees continues to increase. In 1980, 34 percent of all examinees were women, compared to 27 percent in 1977. Although the changes in the racial ethnic composition of the 1980 examinee group were very small, there was a decrease in the number of white examinees while the various underrepresented minorities maintained essentially the same percentages of the examinee pool as in 1979.

The Medical Sciences Knowledge Profile examination was administered for the second time in June 1981 and 1,776 citizens or permanent resident aliens from the U.S. and Canada sat for the examination. The examination is provided to assist constituent schools of the AAMC in their deliberations about individuals seeking advanced placement. The MSKP program is sponsored by the AAMC and the test is developed and administered by the National Board of Medical Examiners.

While 5.7 percent of those registering for the test have degrees in other health professions, 87 percent of all registrants indicated they were currently enrolled in a foreign medical school. The total number of examinees for the 1981 administration was only 20 fewer than the number who sat for the first MSKP examination in 1980.

A two-year grant from the Department of Health and Human Services for the AAMC's Simulated Minority Admissions Exercise Workshops was successfully completed in December 1980. The grant supported sixteen SMAE Workshops held at various medical schools across the country and involved over 500 medical school personnel including deans, department chairpersons, admissions officers, faculty and others in student affairs. The SMAE Workshops developed by the AAMC in 1974 assist admission committees to evaluate noncognitive information on nontraditional (minority) applicants to medical school. Most recently, the Office of Health Resources Opportunity has officially notified the AAMC of the award of a new grant to support a series of workshops to be held at several medical schools in each region. These will include retention and learning skills workshops, training and development workshops for student financial aid program administrations, and a counseling workshop for minority and financially disadvantaged students accepted to medical school and for premedical advisors. Simulated Minority Admissions Workshops will also be offered to medical schools.

Efforts continued to improve the availability and types of financial assistance for medical students and the administrative expertise of medical school financial aid officers. Attempts by both the 96th and 97th Congresses to pass legislation in the areas of health manpower and education that would impact on the entire spectrum of financial aid programs available to medical students were carefully monitored. Testimony and written comments were delivered at each appropriate opportunity. Three workshops to improve the administration of financial aid at schools of medicine, osteopathy and dentistry were held during 1980–81. The grant from the Robert Wood Johnson Foundation supporting this activity will provide three more such programs.

The annual medical student graduation questionnaire was administered to the class of 1981 in 119 of the 121 medical schools with seniors. Approximately 11,000 students participated in the survey, a response rate of 69 percent. A summary report comparing national responses with individual institutional data was mailed to each medical school during the summer. Selected results appear in the 1981 Directory of the National Residency Matching Program. A comprehensive study of 1981 graduates is underway.

After two years of careful study, review, and refinement, the Graduate Medical Education Application for Residency, developed by the AAMC at the recommendation of the Task Force on Graduate Medical Education and provided by the National Resident Matching Program, was implemented this spring. Applications were disseminated, along with NRMP materials, to medical school student affairs offices for use by students planning to enter residency programs. This universal application will facilitate the process of applying for a residency position by providing a standard form for transmittal of basic information from students to hospital program directors. Program directors may request supplemental information from applicants.

In 1980–81 at the suggestion of the Group on Student Affairs "Recommendations of the AAMC Concerning Medical School Acceptance Procedures" were modified to include the provision that all schools offer sufficient places to fill their first-year class by May 15 of each admission cycle. This strategy should lessen the tension in both schools and students produced by the acceptance of large numbers of students during the summer months.

The Group on Student Affairs-Minority Affairs Section has initiated activities outlined in the implementation plan for the recommendations of the AAMC Task Force on Minority

Student Opportunities in Medicine. The first activity, a medical career awareness workshop for high school and college minority students, was conducted April 1981, in Dayton, Ohio.

A grant-in-aid was received from the Commonwealth Fund to produce a book with the working title, "U.S. Medical Students, 1950-2000: Trends and Projections." To help develop meaningful predictions regarding the characteristics of future medical students, a four-round Delphi Survey was initiated. Among the 330 participants in the survey are medical school administrators, faculty and students, preprofessional advisors, Flexner awardees and other opinion leaders. The book is scheduled for publication in 1983.

Institutional Development

In 1972 the Association initiated a program to strengthen the management of medical schools and academic medical centers. The Management Advancement Program continues to develop and conduct educational seminars, to analyze management issues, and to assist in the identification of appropriate consultant services. To date, fifty seminars have been offered; participants from 125 U.S. and 13 Canadian medical schools and 146 hospitals have participated.

The program was designed to assist institutions in the development of goals that would effectively integrate organizational and individual objectives, to strengthen the decision-making and the problem-solving capabilities of academic medical center administrators, to aid in the development of strategies and mechanisms that would allow medical schools and centers the flexibility to adapt more effectively to changing environments, and to develop a better understanding of the function and structure of the academic medical center.

The chief activity of the program this year has been the conduct of Executive Development Seminars for senior academic medical center administrators, an intensive week-long seminar on management theory and technique. During the 1980–81 year there were Executive Development Seminars for medical school deans, teaching hospital directors, chairmen of medicine, service chiefs of affiliated hospitals, and chairmen of pathology. A special seminar was offered for teams of business officers and institutional planners from twenty institutions. The third seminar for women in senior administrative roles in academic medicine was also held. In conjunction with the Veterans Administration central office, a program focused on the academic medical center-VA hospital affiliation relationship was conducted for VA hospital deputy directors as part of their professional development program in the fall of 1981. Plans are underway for additional programs for chairmen of obstetrics/gynecology, pediatrics, and general surgery. A second seminar for business officers and institutional planners will be offered in the spring of 1982.

The Management Advancement Program was planned by an AAMC Steering Committee which continues to participate in program design and monitoring. Faculty from the Sloan School of Management, Massachusetts Institute of Technology, have played an important role in the selection and presentation of seminar content. Consulting expertise has been provided by many individuals including faculty from Harvard University Graduate School of Business Administration, the University of Oklahoma College of Business Administration, the Brigham Young University, the University of North Carolina School of Business Administration, and the George Washington University School of Government and Business Administration. Initial financial support for the program came from the Carnegie Corporation of New York and from the Grant Foundation. Funds for MAP implementation came primarily from the Robert Wood Johnson Foundation. The program is now self-supporting through the use of conference fees.

In 1976 the Management Education Network was designed to identify, document and transmit management information relevant to medical center settings. Supported from the National Library of Medicine, products from the MEN project include a study guide and companion audiovisual tapes on strategic planning, a study on medical school departmental review, and a simulation model and companion study on tenure and promotion in academic medical centers. The final report of the study of academic tenure was distributed this past year. During the course of the tenure study the information developed has been made available to many medical schools concerned with tenure questions.

The studies of the career patterns of medical school deans and vice presidents for health sciences and their implications for medical school leadership and management are continuing, supported by the Commonwealth Fund, and will be published shortly.

The exponential growth of medical knowledge and revolutionary changes in information handling technology present important challenges to academic medicine. In response, the AAMC has undertaken studies on the future of health sciences libraries and on information handling in medical schools and hospitals. The primary focus of the health sciences library study is the library's mission and roles in education, research and patient care. Using diverse data collection instruments and with the support of an enthusiastic advisory committee, this study has as its objective the identification of policy issues and planning principles for institutional decision makers. The study aspires to provide workable models for library and learning resources management to assist in determining priorities for action and assessing needs for staff skills development. The study of the health sciences library is supported by the National Library of Medicine for two years, targeted for completion in 1982.

The study of information handling technology for hospital and medical school functions is supported by The Josiah Macy, Jr. Foundation. This eighteen month study will assist in strategic planning for information management in the academic medical center. Tasks of the study are to collect, analyze, and disseminate information about available and new technology and to provide a basis for assessing the impact of technology on the information handling functions of the academic medical center. Current information handling practices will be described; areas where there is substantial potential for change will be identified and policy issues associated with potential changes will be discussed.

One important value of these studies already apparent is their catalytic effect in stimulating dialogue among institutional officials with diverse information handling needs and responsibilities. These discussions are leading to new perspectives on the possibilities for greater intra-institutional cooperation and coordination of related tasks.

Teaching Hospitals

The Association's teaching hospital activities were concentrated in six areas during 1980–81: the budget reconciliation acts of 1980 and 1981; health care competition; legislative and regulatory analysis; house staff unionization; a major study of teaching hospitals; and surveys and publications.

For the first time in the Congressional budget process, a House-Senate conference committee began work in mid-September 1980 to resolve differences between two versions of a budget reconciliation bill for trimming the federal government's budget for fiscal year 1981. In this process, AAMC supported a provision in the House bill that would repeal Section 227 of the Social Security Act, the highly controversial Medicare provision which discriminated against physicians caring for patients in teaching hospitals. The Association opposed certain provisions in the Senate bill relating to Medicaid and Medicare which would have been harmful to teaching hospitals. The final budget reconciliation act signed by President Carter contained many Medicare-Medicaid reimbursement reforms, including the AAMC-supported provision which repealed Section 227 of the 1972 Social Security amendments and added new guidelines for paying teaching physicians. The amendment did retain the original Section 227 provision allowing cost reimbursement when elected by all physicians in the hospital. While the list of Medicare-Medicaid amendments was extensive, the House-Senate conferees dropped from the final measure four of the five controversial provisions strongly opposed by the AAMC.

President Reagan's fiscal year 1982 proposed budget called for the imposition of an "interim cap" to limit federal payments under the Medicaid program to $100 million less than the current spending estimate for fiscal year 1981, with a five percent increase above this amount in fiscal year 1982. Increases beyond that fiscal year would simply be adjustments for inflation. In return for the reduction in federal support, states would be given increased control over Medicaid eligibility, benefits and reimbursement policies.

To assist in the development of its position, strategy, and testimony concerning the Administration's Medicaid proposal, and to help substantiate the significant role teaching hospitals have in caring for Medicaid patients and the importance of adequate payment for these services, the Association surveyed its teaching hospital members on their Medicaid activities. Citing preliminary statistics from the survey, the Association testified before the Senate Committee on Finance on the proposed Medicaid cap and emphasized that the Administration's proposal would have several adverse effects on teaching hospitals. These included increased hospital bad debts and charity requirements, increased hospital financial distress, increased hospital prices for charge-paying patients, a reversal of hospital accomplishments in providing a one-class standard of care, and creation of a serious barrier to the Administration's interest in competition. The Association urged the Committee to reject the proposed Medicaid budget reductions and to examine other areas of the proposed federal budget where reductions would not have the devastating impact of Medicaid program cutbacks. In addition, the AAMC strongly opposed a denial-of-choice provision which would give the HHS Secretary the authority to permit states to mandate, on a least cost basis, a Medicaid recipient's physician and hospital.

Throughout the spring the AAMC conveyed to members of Congress its opposition to various proposed Medicaid and Medicare budget cuts. Written testimony was submitted to the House Health Subcommittee on the Medicaid component on the Administration's proposed "Health Care Financing Amendments of 1981," which contained the legislative language necessary to implement the proposed federal cap. After careful consideration of the provisions of the House and Senate reconciliation bills, the AAMC Executive Council concluded that the House bill was preferable in most respects to the Senate bill. However, the Association targeted certain Medicare and Medicaid provisions in the House version for opposition. The final reconciliation package signed by President Reagan included milder forms of some of the provisions opposed by teaching hospitals. The Administration's proposed Medicaid cap was replaced by reductions of 3 percent in federal Medicaid funding in fiscal year 1982; 4 percent in 1983; and 4½ percent in 1984. These reductions could, however, be minimized or eliminated entirely if certain specified criteria are met by the state.

Since the defeat of President Carter's hospital cost containment legislation in 1979, increasing attention has been given to ways of injecting price competition into the health care marketplace to stimulate cost consciousness among providers and consumers. Many advocates see the competitive approach as an alternative to regulations and mandatory controls on health care costs. An AAMC *ad hoc* Committee on Competition met to explore the implications of price competition for teaching hospitals. Its draft report was accepted by the Executive Council and developed into a monograph, "Price Competition in the Health Care Marketplace—Issues for Teaching Hospitals." This widely distributed document raises important issues that must be understood and addressed in the debate on competition legislation. Advocates of price competition recognize that teaching hospitals have multiple products which benefit not only individual patients, but society as a whole. The commonly offered solution is to identify and publicly fund these additional activities based on their own merits. However, the AAMC has emphasized that attempts to segment the unique characteristics of teaching hospitals into measurable units risk ignoring that their contributions are the products of inter-related programs, which together provide the environment and resources required for teaching future health manpower and advancing medical knowledge and practice.

In 1980 the Senate Subcommittee on Health and Scientific Research considered two bills to provide assistance to financially failing hospitals. The AAMC provided testimony for the hearing record in support of the bills with certain modifications. Of particular concern was the effect of the hospitals' fiscal stringencies on their graduate medical education programs.

The AAMC agreed that federal action was necessary to adequately address the problem. Noting that hospitals which serve large numbers of medically indigent and poor patients need long-term solutions which modify the financing of health services for those populations, the AAMC urged immediate, external assistance that could include modifications in Medicare Section 223 limitation procedures, Medicare and Medicaid participation in hospital bad debts, special project funds to modernize facilities, and special project grant programs for hospital operations. While supporting both pieces of legislation as interim, emergency measures for transitory relief to financially troubled hospitals on the brink of closure, the AAMC emphasized that without long-term reforms to address the inequities of current reimbursement policies and the gaps in health insurance coverage, these measures would do little more than temporarily veil the continuing threat of bankruptcy and closure for these hospitals.

While such legislation was eventually tabled, the Health Care Financing Administration published a notice soliciting applications from state Medicaid agencies for demonstration projects to improve the efficiency of services and management in financially troubled hospitals in medically underserved rural and inner-city areas. Under this program HCFA granted $11 million for health maintenance organization/hospital oriented projects at teaching hospitals in Boston, Jacksonville, and Los Angeles.

The Association commented on proposed HCFA regulations making changes to the Conditions of Participation for Hospitals under the Medicare and Medicaid programs. While generally supportive of the potential for allowing hospitals greater flexibility in performing administrative and managerial functions, the Association identified a number of areas of concern and presented comments and recommendations regarding 52 technical issues.

The AAMC also commented on proposed HCFA regulations establishing incentive reimbursement for outpatient dialysis and self-care dialysis training. The Association noted that the proposed regulations recognized and provided for different reimbursement rates for hospital-based and independent (free-standing) dialysis services, and urged this distinction be retained. The AAMC was concerned, however, that the proposed regulations included a detailed statistical methodology for calculating the incentive reimbursement rate in the admitted absence of adequate data. The Association asked HCFA to delay promulgation of incentive reimbursement rates until appropriate data could be collected and the impact of the rates on beneficiaries and providers could be analyzed.

In the area of health planning, the Office of Management and Budget proposed establishing policies and procedures to halt federal financial support for hospital construction in overbedded areas. The AAMC expressed several concerns about the memorandum, foremost being its disregard for the capabilities of the existing health planning structure to monitor hospital construction. The incoming Reagan Administration later rescinded the OMB memorandum.

Final regulations were issued establishing the minimum requirements for satisfactory certificate of need review programs under amendments to the health planning law. A major concern about the status of proposed capital expenditures or major medical equipment acquisitions for research and training was addressed in the final CON regulations, which emphasized that: "Only clinically related services are included in the definition of institutional health services; consequently, research services *per se* are not required to be subject to review. Capital expenditures are required to be reviewed only if they are made by or on behalf of the health care facility. Major medical equipment acquired for research purposes need not be subject to review if the equipment will not be used to provide services to inpatients of a hospital."

The Health Programs Extension Act of 1980 also contained several health planning amendments. The AAMC worked closely with Congressional staff to develop an amendment providing an exception to the existing CON requirements for the acquisition of major medical equipment, provision of institutional health services, or the obligation of capital expenditures undertaken solely for purposes of research.

The AAMC commented on the proposed national health planning goals on health status outcomes, disease prevention and health promotion, and institutional and personnel resources. The Association criticized the planning goals as lacking a sense of realism and consistency, for there was no discussion of the cost and funding implications of pursuing such goals. The Association also emphasized that it was the expressed intent of Congress that decisions about applicability of the goals and standards be made at the local level. A final version of these goals has yet to be published. Regarding the future of the overall health planning program, the AAMC's Executive Council identified several critical deficiencies of the program and its implementation and did not make the planning act a priority for Association action.

In July 1980, the U.S. Court of Appeals for the District of Columbia Circuit ruled that the National Labor Relations Board acted within its statutory authority in its March 1979 *Cedars-Sinai* decision which declared that interns and residents are primarily students rather than employees for coverage under the National Labor Relations Act. The AAMC was *amicus curiae* in the case supporting the NLRB's position, as well as in the original *Cedars-Sinai* case. The Court of Appeals case was brought by the Physicians' National Housestaff Association after an earlier U.S. District Court decision concluded the court had no jurisdiction to review the NLRB's decision. The case, *PNHA v. John H. Fanning et al.*, was then appealed to the U.S. Supreme Court, which denied the motion and left standing the lower court determinations.

During the past year the AAMC participated as *amicus curiae* before the Federal Labor Relations Authority in two cases in which PNHA sought to represent house staff enrolled in graduate medical education programs at Veterans Administration medical centers. The Association also submitted *amicus curiae* briefs before the California Public Employment Relations Board, in a case considering unionization for house staff at hospitals owned and operated by the state, and the NLRB, in the case of *Children's Hospital of Los Angeles v. Interns and*

Residents Association of Children's Hospital. The outcomes of these cases are pending.

The COTH Spring Meeting included a progress report on the Association's major descriptive study of teaching hospitals. With guidance from the *ad hoc* Committee on the Distinctive Characteristics and Related Costs of Teaching Hospitals, the Association's staff developed a methodology for the study. Thirty-three COTH member hospitals submitted a computer tape of their fiscal year 1978 patient discharge abstracts and bills. In addition, hospitals supplied Medicare cost reports, audited financial statements, annual reports, and patient origin studies. Finally, questionnaires on educational programs, hospital staffing and patient services were completed by the study hospitals. During 1980–81 staff completed a major portion of the analysis of the data received. The patient abstract and billing information for more than 500,000 patient records has been analyzed using two case mix measures: diagnosis related groups and disease staging. Data from the three questionnaires and other hospital reports are being prepared for a final report, expected to be available in early 1982. It will present findings on facilities and services, educational programs, hospital staffing, financial characteristics, and patient case mix.

In June 1981, the Association staff completed an analysis of construction projects begun in 1979 among COTH non-federal member hospitals. It was found that 68 percent of the funding of such projects was financed by some form of debt, a dramatic change from 1969 when only 20 percent of such capital was borrowed or financed through debt. Results of the latest survey, which were compared with the pattern of funding for construction projects begun in 1974 and those completed in 1969, were presented in the *COTH Report*, a comprehensive hospital issues-oriented newsletter published ten times annually.

In addition to the newsletter, the Association has maintained its program of regular membership reports and surveys. The Association distributed a revised version of the paper entitled "Toward A More Contemporary Public Understanding of the Teaching Hospital," originally presented at the 1979 COTH Spring Meeting. *The COTH Directory of Educational Programs and Services* was published for the thirteenth consecutive year, providing an operational and educational program profile of each COTH member. House staff stipend and fringe benefit information was again published in the *COTH Survey of House Staff Stipends, Benefits, and Funding*. The Association also published datagrams in the *Journal of Medical Education* on the topics of teaching hospital construction funding, university-owned teaching hospital income, and house staff compensation and funding.

Communications

During the year the AAMC employed a variety of publications, news releases, news conferences and personal interviews with representatives of the news media to communicate its views, studies, and reports to its constituents, interested federal representatives, and the general public.

More than 20 news media interviews and requests for information and policy statements are initiated or responded to by AAMC staff each week. This media interaction has, in part, been responsible for the editors of *U.S. News and World Report*, for the fifth consecutive year, naming the Association's President "as one of the five most influential leaders in the health field in the U.S." In compiling their list of influential persons in several categories, *U.S. News and World Report* surveys journalists, Capitol Hill staffers and members of Congress.

The most important publication used by the Association to inform its constituents is the *President's Weekly Activities Report*. This report, which is issued 43 times a year and reaches about 9,000 readers, reports on AAMC activities and federal activities that have a direct effect on medical education, biomedical and behavioral research, and health care.

The *Journal of Medical Education* in fiscal year 1981 published 1,045 pages of editorial material in the regular monthly issues, compared with 1,039 pages the previous year, including 88 regular articles, 72 Communications, and 10 Briefs. The *Journal* also continued to publish editorials, datagrams, book reviews, letters to the editor, and bibliographies provided by the National Library of Medicine.

The volume of manuscripts submitted to the *Journal* for consideration continued to run high. Papers received in 1980–81 totaled 421; 130 were accepted for publication, 203 were rejected, 10 were withdrawn, and 78 were pending as the year ended. The *Journal's* monthly circulation averaged about 6,500, an increase of 100 compared with 1980. During the year, special issues were devoted to geriatrics and medical education and to the AAMC Annual Meeting plenary session addresses. The AAMC's Annual Report and Annual Meeting program were published as a supplement.

About 32,000 copies of the annual *Medical School Admission Requirements*, 4,500 copies of the *AAMC Directory of American Medical Education*, and 8,000 copies of the *AAMC Curriculum Directory* were sold or distributed. Numerous other publications, such as directories, reports, papers, studies, and proceedings, also were produced and distributed by the AAMC.

The *COTH Report* is the newsletter of the Association's Council of Teaching Hospitals. It is published 10 times annually and is distributed to more than 2,600 subscribers. The newsletter provides a comprehensive review of Association and COTH activities; federal legislative and regulatory issues of relevance to the academic medical/teaching hospital community; pertinent surveys, studies, reports and other publications; and current health care topics of interest. Other newsletters include the *OSR Report*, which is circulated twice a year to medical students; *STAR* (Student Affairs Reporter), which is printed twice a year and has a circulation of 1,000; and the *Council of Academic Societies Brief*, which is published four times a year and has a circulation of 5,000.

Information Systems

The Association has a general purpose computer system to support its information requirements. This in-house system facilitates the optimum use of the Association's information resources for its programs. The development and use of the information systems have increased significantly during the past year, and the Association's activities are now enhanced by comprehensive student, faculty, and institutional data systems.

The information systems on medical students continue to develop and expand. Work continues on a unified system to monitor students from their pre-medical years through the application process, medical school, and into the first years of post-M.D. experience. This system will provide the basis for both historical perspective and current information on medical students in the United States.

The heart of the medical student information system is the American Medical College Application Service system. This system supports the Association's centralized application service by capturing data on applicants to medical school and linking applicant data with the MCAT test scores and academic record information for each applicant. Medical schools and applicants are informed of the application process through daily status reports, and medical schools regularly receive rosters of applicants and summary statistics which compare their applicants with the national applicant pool. Each applicant's record is immediately available via computer terminal to appropriate Association personnel responding to telephone inquiries from applicants and medical school personnel.

The information in the AMCAS system is the basis for special reports generated throughout the year and provides answers to questions posed by medical school personnel and Association staff. The AMCAS system is also used for regular descriptive studies of medical school applicants as well as more focused, issued-oriented studies.

A number of other data systems supplement the AMCAS information on medical students. Among these are the Medical College Admission Test reference system, which contains MCAT score information for all examinees; the college system, which contains information on all U.S. and Canadian colleges and universities; and the Medical Sciences Knowledge Profile system on individuals applying to take the MSKP exam for advanced standing admission to U.S. medical schools.

Information on students enrolled in U.S. medical schools is maintained in the student records system. This system, maintained in cooperation with the medical schools, follows the progress of medical students from matriculation through graduation. The information in the student records system is supplemented periodically through the administration of surveys, such as the Graduation Questionnaire and the financial aid survey, to specific groups or samples of medical students.

The Association maintains two major information systems on medical school faculty. The faculty roster system includes information on the background, current academic appointment, employment history, education, and training of all salaried faculty at U.S. medical schools. This information is maintained in cooperation with medical school staff by Association personnel having online access and capability to update the information. Data in the Faculty Roster system are periodically reported to the medical school in summary fashion, enabling the schools to obtain an organized, systematic profile of their faculty. The faculty salary survey system contains information from the Association's annual survey of medical school faculty salaries. This information is used for the annual report on medical school faculty salaries and is available on a confidential, aggregated basis in response to special inquiries from the schools.

The Association maintains a number of institutional information systems, including the

Institutional Profile System, a repository for information on medical schools. Information is entered both directly from surveys sent to the medical schools and through other information systems, from which data are aggregated by medical school. The information is maintained in a data base supported by a software package that allows immediate user retrieval via computer terminal. The system is used to respond to requests for data from medical schools and other interested parties, and to support a variety of research projects. There are over 20,000 items of information currently in IPS describing many aspects and characteristics of medical schools from the early 1960s through the present.

An ancillary system to the Institutional Profile System has been developed to process Part I of the Liaison Committee on Medical Education annual questionnaire. This allows data input and on-line editing of the data, and generates reports that identify errors and inconsistencies in the data on the questionnaires and compare the values from the current year with those reported from the previous four years. This system produces information used in the report of medical schools' finances which appears in the annual education issue of the *Journal of the American Medical Association.*

Information on the teaching hospitals is also maintained. The Association's program of teaching hospital surveys combines four recurring surveys with special issue oriented surveys. The annual surveys are the educational program and services survey, the house staff policy survey, the income and expenses survey for university-owned hospitals, and the executive salary survey. These serve as the basis of four annual reports generated by the Association and provide answers to special requests made by the member hospitals.

Data collection and information dissemination efforts of the Association continue to give attention to special areas or issues of concern to medical education. Among the areas currently receiving focused attention are the status of women in academic medicine, the status of medical practice plans in the medical schools, and the case mix of patients in teaching hospitals. The Association staff will continue to use all available information resources to focus on these and other areas of importance to academic medicine.

AAMC Membership

Type	1979-80	1980-81
Institutional	116	123
Provisional Institutional	10	3
Affiliate	16	16
Graduate Affiliate	1	1
Subscriber	18	18
Academic Societies	69	71
Teaching Hospitals	423	410
Corresponding	40	28
Individual	1,384	1,301
Distinguished Service	48	52
Emeritus	62	50
Contributing	15	4
Sustaining	14	12

Treasurer's Report

The Association's Audit Committee met on September 4, 1981, and reviewed in detail the audited statements and the audit report for the fiscal year ended June 30, 1981. Meeting with the Committee were representatives of Ernst & Whinney, the Association's auditors, and Association staff. On September 11, the Executive Council reviewed and accepted the final unqualified audit report.

Income for the year totaled $9,474,657. Of that amount $8,034,218 (85%) originated from general fund sources; $241,112 (2%) from the foundation grants; $1,199,327 (13%) from federal government reimbursement contracts.

Expenses for the year totaled $8,726,381 of which $7,074,083 (81%) was chargeable to the continuing activities of the Association; $293,099 (3%) to foundation grants; $1,199,327 (14%) to federal cost reimbursement contracts; $159,872 (2%) to Council designated reserves. Investment in fixed assets (net of depreciation) increased $270,228 to $1,020,163.

Balances in funds restricted by the grantor increased $100,210 to $470,996. After making provisions for reserves in the amount of $250,000 principally for special legal contingencies and MCAT and AMCAS development, unrestricted funds available for general purposes increased $80,357 to $6,775,972, an amount equal to 78% of the expense recorded for the year. This reserve accumulation is within the directive of the Executive Council that the Association maintains as a goal an unrestricted reserve of 100% of the Association's total annual budget. It is of continuing importance that an adequate reserve be maintained.

The Association's financial position is strong. As we look to the future, however, and recognize the multitude of complex issues facing medical education, it is apparent that the demands on the Association's resources will continue unabated.

Association of American Medical Colleges
Balance Sheet
June 30, 1981

ASSETS		
Cash		$ 8,852
Investments		
Certificates of Deposit		11,148,085
Accounts Receivable		715,356
Deposits and Prepaid Items		51,052
Equipment (Net of Depreciation)		1,020,163
Total Assets		$12,943,508
LIABILITIES AND FUND BALANCES		
Liabilities		
Accounts Payable		$ 776,567
Deferred Income		1,765,805
Fund Balances		
Funds Restricted by Grantor for Special Purposes		470,996
General Funds		
Funds Restricted for Plant Investment	296,856	
Funds Restricted by Executive Council for Special Purposes	1,837,149	
Investment in Fixed Assets	1,020,163	
General Purposes Fund	6,775,972	9,930,140
Total Liabilities and Fund Balances		$12,943,508

Association of American Medical Colleges
Operating Statement
Fiscal Year Ended June 30, 1981

SOURCE OF FUNDS	
Income	
Dues and Service Fees from Members	$2,456,689
Grants Restricted by Grantor	241,112
Cost Reimbursement Contracts	1,199,327
Special Services	3,647,896
Journal of Medical Education	79,675
Other Publications	325,627
Sundry (Interest $1,172,326)	1,524,331
Total Income	$9,474,657
Reserve for Special Legal Contingencies	50,000
Reserve for CAS Services Program	–0–
Reserve for Special Studies	11,809
Reserve for Minority Programs	–0–
Reserve for Patient Intensity Program	39,757
Reserve for Personal Assessment	31,031
Reserve for House Staff Meetings	27,275
Total Source of Funds	$9,634,529
USE OF FUNDS	
Operating Expenses	
Salaries and Wages	$4,035,707
Staff Benefits	599,452
Supplies and Services	3,180,592
Provision for Depreciation	209,314
Travel and Meetings	697,730
Loss on Disposal of fixed assets	3,586
Total Expenses	$8,726,381
Increase in Investment in Fixed Assets (Net of Depreciation)	270,228
Transfer to Executive Council Reserved Funds for Special Programs	250,000
Reserve for Replacement of Equipment	207,353
Increase in Restricted Fund Balances	100,210
Increase in General Purposes Fund	80,357
Total Use of Funds	$9,634,529

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NORTHEASTERN OHIO UNIVERSITIES COLLEGE OF MEDICINE

Rootstown, Ohio

Provost and Dean

Applications are invited for the position of Provost and Dean of the Northeastern Ohio Universities College of Medicine. This position combines the duties and responsibilities of the chief executive officer of the College, the Provost (President), and those of the chief academic officer, the Dean. The Provost and Dean reports directly to a nine-member, statutorily created Board of Trustees.

The College: The Northeastern Ohio Universities College of Medicine was established by the Ohio General Assembly in 1973, and operates in concert with The University of Akron, Kent State University and Youngstown State University. The College has been authorized by the Ohio Board of Regents to grant the Doctor of Medicine degree, and is fully accredited by the Liaison Committee on Medical Education of the AMA/AAMC. The College graduated its Charter Class of 42 physicians in May, 1981.

Clinical instruction of the College's 314 undergraduate medical students takes place at 14 associated community hospitals in Akron, Barberton, Canton, Cuyahoga Falls, Ravenna, Youngstown, and Warren. Students are admitted to the six-year, combined B.S./M.D. degree program directly upon graduation from high school.

The College has an educational and general operating budget for 1981-82 of $10 million. A modern Basic Medical Sciences Campus, located just south of Interstate 76, at State Route 44 in Rootstown, Ohio, is valued in excess of $13 million. Ambulatory teaching facilities have been established at seven of the major teaching hospitals associated with the College and are valued in excess of $13 million. The College does not seek to establish or operate a medical center at the Rootstown campus, and will continue to rely upon the associated community hospitals to provide the clinical teaching setting.

Qualifications: Candidates for the Provost and Dean position must possess a Doctor of Medicine degree.

Candidates must have substantial successful experience in undergraduate medical education and be familiar with the organization and administration of public higher education. In addition, the candidate will be expected to demonstrate abilities in the planning process, the public appropriations process, institutional budget development, administration and quality control of a decentralized curriculum, development and operation of residency training programs, use of community hospitals as the clinical teaching base, organization and administration of basic sciences and clinical research, working with practicing physicians, working with a Board of Trustees on overall institutional policy and governance, and must possess a highly refined sense of community, human, media, and political relations.

It is highly desirable that the candidate be familiar with the medical school admissions process, the requirements of continuing medical education, and have demonstrated sensitivity to the needs of undergraduate medical students.

Salary: Salary is open and will be predicated upon the candidate's background, experience, and educational preparation and will be competitive with salaries for similar chief executive officer positions. Comprehensive fringe benefits program available. There is no statutory salary ceiling in Ohio.

Starting Date: Appointment of the Provost and Dean is to be effective at the earliest time convenient to the candidate.

Applications: Letters of applications with curriculum vitae, the names and addresses of at least five professional references, and an official copy of a transcript reflecting receipt of the Doctor of Medicine degree, should be sent to:

John J. Cotfelt, Ed.D., Chairman
Provost and Dean General Search Committee
c/o Northeastern Ohio Universities College of Medicine
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Factors Influencing Decisions To Enter Careers in Clinical Investigation

Wayne K. Davis, Ph.D., and William N. Kelley, M.D.

Abstract—Factors associated with decisions to enter careers in clinical research were studied based on surveys completed by successful clinical investigators. Three aspects of career decision-making were explored: the timing of the decision to enter a research career, the relationship between research success and the timing of the decision, and the impact of two disincentives to enter research careers (the payback provisions of the national research service awards and the abolition of the physician draft that decreased the attractiveness of research training as an alternative). Survey results document the importance of medical school experiences in career decisions. Further, the correlation between the time of career decision and research success supports arguments for early research experiences upon which decisions can be made. Disincentives for entering a research career were not seen as barriers that would have prevented the majority of respondents from entering a research career. The results of the study led to a strong recommendation that research opportunities for medical students be enhanced as one mechanism for positively influencing decisions in favor of research careers.

The biomedical research community has become increasingly concerned with the declining number of clinical investigators. Evidence of this problem has included a reduced interest in research careers expressed by medical students (1), the shift from M.D. to Ph.D. trainees in research fellowship positions provided through the National Research Service Award (NRSA) Program (2), the reduced number of new National Institutes of Health-funded principal investigators holding M.D. degrees (2), and the large number of open faculty positions in clinical departments (3). Not only is there abundant evidence of a real and significant decline in the number of physician researchers, but also there is a projected increase in the magnitude of the problem with the diminished numbers of medical students reporting an interest in research. It is important, therefore, to determine the reasons for this decline so that solutions to the problem may be developed.

While there are no data currently available to delineate the reasons for the decline in research interests among young physicians, Wyngaarden (2) has suggested several possible causes. These included: (*a*) the reevaluation of societal goals in the wake of the Vietnam conflict with an attendant swing away from biomedical research and toward medical care for underserved segments of the society, (*b*) medical school curriculum revisions that have re-

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Dr. Davis is associate professor of postgraduate medicine and health professions education and director of the Office of Educational Resources and Research; Dr. Kelley is professor and chairman, Department of Internal Medicine; both are at the University of Michigan Medical School, Ann Arbor.

duced the amount of research laboratory experiences available to students in the basic science years, (*c*) the perceived instability of federal funding for biomedical research and training in research, and (*d*) the lack of acceptance of research training as an appropriate portion of residency training by the specialty certifying boards. Additional reasons suggested by Wyngaarden (2) and others have included: (*a*) abolition of the physician draft, which has reduced the attractiveness of research training at government institutions, such as the NIH, where service fulfilled one's military obligation, (*b*) the relative financial attractiveness of a practice career as compared with a research career (4), and (*c*) the negative impact of the "payback provision" of the NRSAs (3).

The goal of this study was to assess the importance of some of these factors on decisions made by individuals to pursue research careers. The current paper is focused specifically on the clinical investigator with regard to: (*a*) the timing of his decision to enter research, (*b*) the relationship between the timing of the decision and research success, and (*c*) the effect of disincentives for entering a research career (the payback provisions and the military obligation).

Methods

To achieve the purposes of this study, the authors designed and mailed a questionnaire to "successful" clinical investigators in the spring of 1980. No attempt was made to identify a control group of "unsuccessful" clinical investigators, as the study was designed not to test the impact of an experimental program but rather to identify correlates of career decisions and success for clinical investigators. The survey population included 381 members of the American Society for Clinical Investigation (ASCI) who completed a similar questionnaire in 1975 (5), an additional 381 ASCI members who were age-matched to the original group to detect temporal change between 1975 and 1980, and a third group composed of 381 members of the American Federation for Clinical Research who were not members of the ASCI, age-matched to the original cohort. The questionnaire covered many topics ranging from job satisfaction to the amount of currently funded research (6). Based on comparative analyses, the three groups were not found to differ on the variables of interest for this paper. Therefore, the three subgroups were combined and treated as a single sample for purposes of this study.

Two questions were asked on the questionnaire regarding the timing of the career decision. The first was: "How old were you when you decided to enter research?" The second question asked whether a specific person or event clearly affected this decision. In response to this question, respondents were asked to provide details of the event or person. The responses to each of these questions provided different and important perspectives into the decision-making process. Combining the age at the time of the decision with data in other parts of the questionnaire, the temporal relationship between medical education and the respondent's decision was determined. Although a chronological outline of the respondent's medical education and training was requested, it was not possible to determine exactly the end of residency training and the beginning of fellowship training. Responses describing details of individuals or events affecting research career decisions were analyzed to determine the impact of mentors, powerful personal interactions, and events that affected the decisions.

To determine whether the timing of the decision was related to the ultimate success of the researcher, an arbitrary index of research success was developed based on data provided in the questionnaire. The index of research success was a weighted combination of three other variables: current research dollars awarded from all sources except pharmaceutical companies (60 percent), average number of research papers published per year over the past 10 years (30 percent), and the number of research trainees currently supported (10 percent). The values for each of these variables were standardized (by subtracting the mean and dividing by the standard deviation of each variable's distribution). The three scores (research dollars, publications, and trainees) were then combined into a single total score by multiplying each by its predetermined relative weight and summing the three component scores. The total scores were rank-ordered and assigned to nine groups (values one to nine), with level nine being the highest level of research success and level one the lowest. The resulting distribution of research success indices approximated a normal distribution. The ages given for a research career decision were then correlated with the scores on the research success index.

While the current disincentives to enter research careers were not present when the respondents made their decisions, they were queried regarding the possible effects of the currently imposed disincentives. Each respondent was asked, "Did your training meet your military obligation?" Respondents who answered "yes" were asked whether they would have done their research training had it not fulfilled this obligation. They were also asked to express their willingness to complete research training had a month-for-month payback been required.

Results

A total of 1,143 questionnaires were mailed, and 553 (48 percent) were returned in usable form. Of the 553, 37 were eliminated from this study because the respondent: (*a*) held a Ph.D. and not an M.D. degree or (*b*) was 65 years old or older and/or had retired. The analyses reported in this paper were conducted on the remaining sample of 516 respondents (45 percent).

Figure 1 presents the data relating career decisions to age. Twenty-one percent of the respondents had decided upon a research career before entering medical school. For 45 percent of the respondents, the decision to enter a research career was made during medical school. Residency and fellowship training accounted for the remaining 34 percent of the decisions.

Two-hundred seventy respondents identified a particular person who or event that most affected their decision to enter research. Of these, 151 described a person, 116 described an event, and three provided no detailed information. A careful analysis of these descriptions was used to determine exactly when they occurred. Figure 2 presents the frequency of decisions in each of four categories: before medical school, during medical school, during residency, and after the residency experience. A decrease in sample size ($n = 171$) was caused by respondents describing a person or event in such a way that the timing could not be ascertained. Based on this analysis, respondents were most influenced by specific events or people during medical school and following residency education. Forty percent of the descriptions were based on medical school experiences, and 35 percent described experiences following residency training. Most experiences described following the residency occurred during fellowship training. Only 14 percent of the described events occurred prior to medical school and 11 percent during residency.

The relationship between the timing of the decision and research success was determined by correlating the respondent's

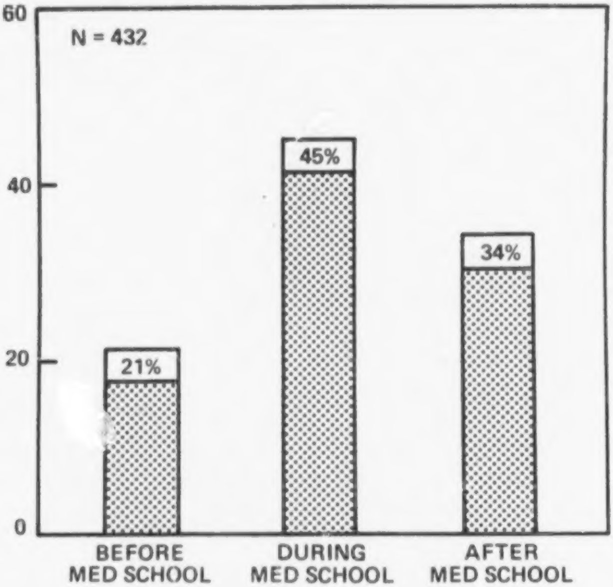

FIGURE 1

Percentage of clinical researchers responding to questionnaire who made career decisions before, during, and after medical school.

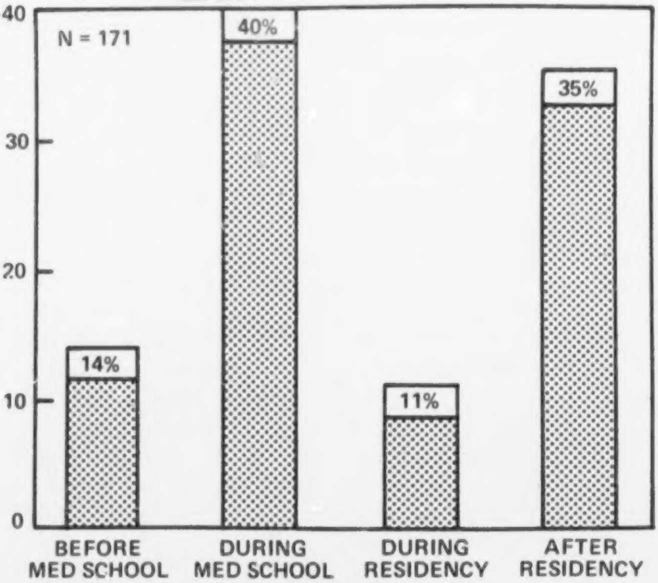

FIGURE 2

Percentage of responding clinical researchers whose career decisions were affected by a particular person or event.

age at the time of the decision with the score on the index of research success. The correlation coefficient (−.14; df = 365; p = .01), although small in magnitude, is statistically significant and indicated an inverse relationship between the time the decision was made and the research success of the investigator.

In response to the question on whether the training met a military obligation, 156 respondents (32 percent) indicated that it had, 328 (68 percent) indicated that it had not, and 32 did not answer the question. Of the individuals whose training had met their military obligation, 125 had done their training at the NIH, 20 in the armed forces, nine at the Center for Disease Control, and two in the U.S. Public Health Service. When the 156 respondents whose training fulfilled their military obligation were asked whether they would have done their training had it not fulfilled this obligation, 130 (85 percent) answered yes, 23 (15 percent) said no, and three did not answer the question. When the same 156 individuals were asked whether they would have done their research training if a month-for-month payback requirement had been required, 114 (78 percent) indicated they would have done the training anyway, 33 (22 percent) indicated they would not have done the training, and nine did not answer the question.

Discussion

This study illuminates several factors that have influenced decisions of successful clinical investigators to pursue a research career. Analysis of two discrete variables provided evidence that the decision to pursue a career in clinical investigation occurred most often during medical school. First, the largest fraction of respondents indicated that their research career decision was made during medical school. Secondly, the most important events which positively influenced this decision also occurred during the years in medical school. The large percentage of respondents (29 percent) who mentioned a specific person influential in their career choice also underscored the importance of research mentors during the medical school period. Finally, the observation that research success was related to the timing of the decision to enter a research career, that is, that earlier decisions were correlated with success, further underscored the importance of medical school experiences.

The finding that more decisions to enter research were made during medical school than at any other time is perhaps not surprising since the opportunities to view role models and be involved in research are limited prior to medical school and are restricted during the residency period when the emphasis is on patient care and not clinical research. Although selected residencies stress research, students may not select them unless an interest in research has been kindled during medical school.

It is recommended, based on the results of this study, that medical school curricula be carefully reexamined and modified in an effort to maximize the research opportunities for interested students. This recommendation is further underscored by the observed relationship between early decisions and greater research success. Emphasis should be placed on increasing laboratory and elective clinical research experiences. Totally new approaches appealing to medical students with research abilities should also be tested. Evaluation studies should be conducted to determine the impact of these curricular activities on the number of students choosing careers in clinical research.

Bickel and Morgan (7) reported a survey intended to identify research opportunities for medical students. They described three types of opportunities that should increase the attractiveness of research training for medical students. The first, referred to as "curricular opportunities," included research experiences primarily obtained in the basic science curriculum. Two factors have inhibited the growth and development of these opportunities: the inherent attraction clinical content has for the medical student and the increased emphasis on primary care with a reduced emphasis on research as a socially acceptable career choice. The second opportunity was labeled "extracurricular opportunities." This included research experiences during undergraduate and graduate medical education outside the school (for example, at NIH) and inside the school (for example, student research forums). The third category included the formal M.D.-Ph.D. programs.

Personnel needs in the clinical sciences as estimated by the National Research Council (NRC) call for "an annual increment of approximately 1,800 persons to meet requirements created by expansion and attrition of clinical faculties in medical schools over the next few years." (3) While 73 percent of the U.S. medical schools offer combined M.D.-Ph.D. programs and a selected subset have six-year medical scientist training programs (MSTP) funded by the National Institute for General Medical Sciences, these programs are not supplying the 1,800 potential clinical investigators needed according to the NRC. There are currently 24 MSTP programs, which support 120 new students each year. During the 1980–81 academic year, a total of 681 students were supported.*

It is remarkable that such disincentives as research training not fulfilling the military obligation and the requirement of a month-for-month payback were perceived to be relatively minor factors in the decision-making process. Since the questions were hypothetical to a group of well established investigators, the results are highly suspect. Nonetheless, it is possible that these seemingly large disincentives may be less important than previously thought. Studies should be conducted which determine the impact of these disincentives from the viewpoint of those directly affected.

The present study has utilized the opinions of members of two clinical research organizations. The respondents were nearly all members of faculties of departments of internal medicine throughout the United States. In this sense, the results may only apply to those factors influencing career decisions related to internal medicine. While there is no reason to believe that research career decisions are made in any different way in other disciplines, the results must be interpreted with this limitation. The 45 percent usable response rate represents a further limitation. Since the names were selected from membership lists and no additional information was available on nonrespondents, meaningful comparisons between respondents and nonrespondents were not possible. Therefore, it is possible that a response bias was present, the nature of which was indeterminate.

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Health Care Team Training
In U.S. and Canadian Medical Schools

Cherry McPherson, Ed.D., and Larry A. Sachs, Ph.D.

Abstract—This paper reports the results of a survey to determine the extent to which interdisciplinary health team concepts are being taught as part of the undergraduate curriculum in U.S. and Canadian medical schools. Less than a third (29 percent) of the respondents indicated the existence of a formal program or program component designed to teach health care team skills. Although the total number of reported programs is small, 53 percent of these programs were required for all students. Three overall categories of content taught within the programs included group process skills, role and function of the team and its members, and content related to the health care context. Although the team approach is a process orientation, fewer than half of the programs reported using direct application of the process, that is, building groups of students into teams.

Three major factors have contributed to a reexamination of the health care delivery system that has resulted in an increased emphasis on the health team. First, medicine has begun to embrace the concept of caring for the total person, including attention to all factors that influence the individual's health status. Second, the U.S. government and private foundations have funded special projects to test and promote the team concept (1). The underlying rationales for these projects are primarily economic. As new health professions roles proliferate, ways of enabling each professional to function at his highest level of expertise theoretically would reduce overall health care costs. With physicians working as a team as opposed to individuals on a fee-for-service basis, total costs would also be reduced. Third, there is growing recognition that the nature of certain conditions, such as the multiple problems of geriatric, physically handicapped, or mentally retarded patients, requires the efforts of a committed team of professionals (2, 3). Although there has been wide recognition that the physician must be a fully functioning member if the health team is to operate effectively, there has been untested speculation that few medical schools participate in interdisciplinary programs to teach health team concepts.

The purpose of this study was to determine the extent to which interdisciplinary

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For related editorial, see page 340.

health team concepts are being taught in colleges of medicine throughout the United States and Canada. In those schools reporting the teaching of health team concepts, the study was further designed to identify what concepts, skills, and teaching strategies form the basis of the health team curriculum.

Methods

A letter and a questionnaire were mailed by the authors to the individual listed as the contact person for information about curriculum for each of the 141 U.S. and Canadian medical schools or colleges in the 1978-79 *AAMC Curriculum Directory* (4). The letter explained the purposes of the study and requested the individual's assistance.

The questionnaire consisted of two parts. In the first part, the respondent was asked to reply to the question: "Does your school have a formal program or program component that teaches the team approach in the delivery of health care as part of the undergraduate medical curriculum?" If the reply to this item was affirmative, the respondent was requested to answer the remaining items comprising the second part of the questionnaire.

The second part was designed to gather specific information regarding the identified health team programs. Major items were constructed to elicit information concerning the academic status of the program, administrative responsibility for the program, the number of participating students by profession, types of clinical facilities utilized, the content of the program, teaching techniques employed, and health professionals identified as part of the team. Each item included several subitems to allow respondents to list or select among specific options. Additionally, space was provided for respondents to list "other" categories not included within the item.

A review of the literature to determine characteristics of programs teaching health care team concepts was conducted prior to construction of the questionnaire. Items within the questionnaire were constructed to reflect characteristics of reported programs. The draft instrument was reviewed, edited, and revised by members of the project staff for the study.

The questionnaire was mailed to subjects in April 1980 with a four-week follow-up. Questionnaires were completed and returned by respondents from 105 (91 U.S. and 14 Canadian) of the 141 (74 percent) medical schools included in the survey. Eight of these were incomplete. In each of these cases, the respondent was contacted by telephone to supply the necessary information.

Results

Within the 105-member respondent group, 30 (27 U.S. and 3 Canadian) reported that the school included a formal program or program component that teaches the team approach in the delivery of health care as part of the undergraduate medical curriculum. Although the number of reported programs is small, the major findings of this survey generate a profile that merits consideration.

Most of the programs (73 percent) were the administrative responsibility of a single clinical department. Twelve (40 percent) were administered through departments of family and/or community medicine, while four (13 percent) were housed in departments of medicine. Ten of the programs were taught in the preclinical years only, 11 in the clinical years only, and nine in both preclinical and clinical years. While the total number of programs is small, 53 percent of these were required for all students. The number of students enrolled in a given program ranged from one to a total class size of 256. Most of the programs (20, or 67 percent) were headed by a physician. No other professional group was identified as being responsible for the program with a frequency greater than one.

Table 1 presents the frequency with which various professionals were identified as members of the team. A great majority of schools included the physician, nurse, and social worker as team members. Other professionals cited with high frequency were the physical therapist, psychologist, psychiatrist, and internist. Three categories were added by respondents to the original list: pharmacist, physician's assistant, and allied health worker.

A summary of the content taught within health care team programs is presented in Table 2. Three overall categories of content can be identified: group process skills, roles and function of the team and its members, and content related to the health care context. Only the latter category arises out of the health sciences; the major components of team development derive from behavioral and management sciences.

The most widely used technique to teach health care team concepts and skills was the field or clinical experience (Table 3). Other widely used methods included lecture/discussion, small group discussion, and role-modeling. Although the team approach is a process orientation, fewer than

TABLE 1

Proportion of 30 U.S. and Canadian Medical School Programs Identifying Various Professionals as Members of the Health Care Team

Professionals	Percent of Programs
Physician	100
Nurse	97
Social worker	93
Physical therapist	63
Psychiatrist	60
Internist	53
Psychologist	53
Mental health worker	43
Health aide, nurse aide	40
Team secretary	37
Dentist	33
Community/family health worker	33
Surgeon	30
Health advocate	23
School teacher	17
Pharmacist	13
Physician's assistant	7
Allied health worker	3

TABLE 2

Proportion of U.S. and Canadian Medical School Programs Teaching Specific Health Care Team Concepts and Skills

Concepts and Skills	Percent of Preclinical Programs ($n = 19$)	Percent of Clinical Programs ($n = 20$)
Family interactions	95	85
Issues in health care	95	75
Professional roles		
Traditional roles	89	80
Role expectations	68	75
Coping with changing roles	58	45
Group process skills		
Communication	89	85
Group problem-solving	68	90
Decision-making	63	85
Leadership	63	65
Goal-setting	58	75
Role negotiation	58	50
Conflict management	32	35
Function of the team	79	80
Concepts of primary care	79	75
Task orientation	47	60

TABLE 3

Proportion of U.S. and Canadian Medical School Health Care Team Programs Using Various Teaching Methods in Preclinical and Clinical Years

Teaching Methods	Percent of Preclinical Programs ($n = 19$)	Percent of Clinical Programs ($n = 20$)
Lecture	68	35
Lecture/discussion	84	70
Small group discussion	73	70
Seminar	58	50
Assigned projects	32	60
Field/clinical experience	79	95
Simulated clinical experience	32	25
Role models	53	65
Films, trigger films	37	30
Building groups of students into teams	42	50

half of the programs reported using direct application of the process: building groups of students into teams.

Discussion

Although not unexpected, the most significant finding of the survey was the apparent low level of activity in health care team training within undergraduate medical curricula. With less than a third (29 percent) of the respondents indicating the existence of a formal program or program component to teach health care team skills, the priority assigned to these concepts is unquestionably low.

Part of the reason for this lack of emphasis may be due to the connotations of the term "health care team." Demonstration projects initiated to model the health care team usually have departed from the curative approach to medicine emphasized in tertiary care centers and developed instead a preventive and maintenance approach to primary care. The fact that many of these early projects served lower socioeconomic groups may also have contributed to a narrow application of the term. Reports of health care team training almost invariably describe a situation in which health professionals have come together to develop a new means of delivering health care (5).

In the health care system, it is nearly always the case that two or more professionals are working interdependently to achieve a common goal in service of the patient. Therefore, it seems logical to conclude that the team approach is basic to the practice of medicine. What is new is not the team but rather the conscious application of behavioral science concepts to the functioning of the team. Within the health sciences, teaching these concepts in a deliberate and studied fashion to students is not common. One very plausible explanation is that these principles—group process skills, management principles, organization dynamics—have developed in disciplines external to the health sciences and were not part of the training programs of the majority of today's physician educators. To teach this content may require either additional training of interested physician educators or the identification of a qualified nonphysician as educator.

Results of the present study indicate that those clinical departments reporting activity in teaching team concepts were often the primary care departments. This can be partially explained by the role of the primary care physician in coordinating various services required for the health maintenance of his patients. Interprofessional coordination among health care providers is further emphasized in primary care departments because of the variety of professionals typically included as departmental faculty. Furthermore, the interprofessional staffing of primary care departments may also increase the likelihood of locating an interested and qualified individual to teach team development skills.

Results of the reported study show that the content taught as part of preclinical health care team training often emphasizes topics only indirectly related to team development skills. These topics—family interactions, issues in health care, concepts of primary care—reflect the milieu in which the team functions rather than the team as an integrated delivery system. The shift in emphasis to team development skills—such as goal setting, decision-making, group problem-solving—during the clinical years suggests that some programs do attempt to prepare students for the interpersonal dynamics required in an integrated approach to health care planning and management.

Learning how to plan and interact with other professionals in an interdependent fashion requires experiential, "hands-on" training as opposed to more traditional classroom learning. The high incidence of field or clinical experiences is encouraging if one assumes that students function as teams during these experiences. The relatively low proportion of programs reporting the building of student groups into teams appears, however, to contradict that assumption. It may be more reasonable to assume that since a significant number of programs are taught during the clinical years, the selection of the item "field/clinical experience" indicates participation in a clerkship as opposed to participation as a team member. If this is indeed the case, some concern over the teaching techniques utilized in team training programs should be expressed.

The U.S. Bureau of Health Professions has stipulated that students from at least three health professions must participate in interdisciplinary education as an eligibility requirement for schools to receive a curriculum development grant. Several of the respondents reporting team training in this study were recipients of these awards, specifically in the areas of geriatrics and nutrition. Recipients of previous awards have expressed concern that federal grant awards are only for a three-year period and that this is not time enough to create conditions leading to institutionalization of the program in question.

If the teaching of health care team concepts is to expand within medical school curricula, a better appreciation for the benefits of the approach must be developed. The ultimate aim of medical education is improved patient care. Team training serves as a means to achieve that aim: by developing improved skills in working with other health professionals, the physician will be able to provide improved patient care.

Conclusion

Although the development of formal programs to teach health care team concepts appears to be a low priority among U.S. and Canadian medical schools, several programs do exist. As the primary care movement expands, it is likely to expect an increased emphasis on interdependent work relationships among health professionals. This may in turn lead to an expansion of programs that teach health care team concepts. The programs that have been reported in this study provide information about content, teaching techniques, and program administration that can serve as guidelines for future programs.

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DATAGRAM

Major Academic Origins of Medical School Deans

According to records maintained by the Department of Institutional Development of the Association of American Medical Colleges, 370 individuals served as deans of U.S. medical schools at some time during the years 1960 through 1980. The department maintains a file on these individuals and holds biographic information on all except one of the persons. This information was examined to determine the nature and major sources of academic training received by deans.

The vast majority of the deans, 349 of the 369, held an M.D. degree or its foreign equivalent. Seventeen of these had also received a Ph.D. degree in addition to their M.D. degree. When the sources of their medical degrees were examined, 331 were found to be graduates of U.S. medical schools, 8 were graduates of Canadian schools, and 10 were graduates of foreign schools outside of Canada. Nineteen U.S. schools each granted M.D.s to more than five of the deans, and together these schools granted

TABLE 1

Academic Origins of U.S. Medical School Deans Serving Between 1960 and 1980 with an M.D. from a U.S. School

Medical Schools	Alumni Serving as Deans		All Alumni	
	No.	Percent of All Deans	No.*	Percentage Serving as Deans
Harvard	36	10.9	6,154	0.58
Cornell	15	4.5	3,304	0.45
University of Pennsylvania	14	4.2	5,943	0.24
Northwestern	13	3.9	5,874	0.22
University of Michigan	11	3.3	5,963	0.18
Johns Hopkins	10	3.0	3,581	0.28
Illinois	9	2.7	6,735	0.13
Minnesota-Minneapolis	9	2.7	5,181	0.17
Chicago (Pritzker)	8	2.4	1,987	0.40
Columbia	8	2.4	4,943	0.16
Rochester	8	2.4	2,114	0.38
Washington-St. Louis	8	2.4	3,893	0.21
Yale	8	2.4	2,446	0.33
Maryland	7	2.1	4,067	0.17
New York University	7	2.1	5,519	0.13
Case Western Reserve	6	1.8	3,040	0.20
Duke	6	1.8	2,349	0.26
Stanford	6	1.8	2,229	0.27
Vanderbilt	6	1.8	2,257	0.27
Subtotal	195	58.9	77,579	0.25
All others	136	41.1	178,903	0.08
Grand Total	331	100.0	256,482	0.13

* Number of living graduates as of December 31, 1967, based on data from *Medical School Alumni, 1967*, published by the American Medical Association (AMA) in 1968. The 1967 alumni figures were used as the best approximation of the average number of alumni living during the period of study. The AMA also has published alumni figures for 1973. The more recent figures were not used because they include a larger number of individuals who held an M.D. during only a portion of the period considered here and exclude M.D.s active in this period who died between 1967 and 1973.

M.D.s to 195 of the deans, or 58.9 percent of all deans with M.D.s from U.S. schools (Table 1).

Harvard had 36 deans among its alumni, the largest number from any one school. Cornell, the University of Pennsylvania, and Northwestern followed Harvard with 15, 14, and 13 deans respectively among their alumni.

To give an indication of the relative contribution by each school in terms of the size of its alumni, the number of living physician graduates from each school at the end of 1967 was studied. This number of alumni was used to estimate what fraction of each school's graduates served as dean during 1960–1980 (Table 1). This percentage figure must be interpreted cautiously in that the deans are from segments of the alumni that do not strictly match the alumni alive in 1967. For example, a number of the deans' fellow graduates living in 1960 were no longer alive in 1967, and many of the more recent graduates might not had advanced far enough in their careers to have served as dean by 1980. For these and other related reasons, the percentages in the final column of Table 1 should not be used as the exact proportion of graduates who may ever serve as dean. It also should be recognized that because Table 1 identifies only those schools that granted M.D.s to more than five deans, schools with five or fewer deans among a small number of graduates might have similar fractions of alumni serving as dean.

With these limitations in mind, the data presented in Table 1 reveal some major differences between the academic origins of M.D. deans and other M.D.s. While the 19 schools listed in Table 1 granted degrees to 58.9 percent of the deans, they granted degrees to only 30.2 percent of all graduates of U.S. medical schools. In comparison with alumni of other schools, alumni of these schools were about three times as likely to serve as dean. When the distribution of the fractions of alumni serving as dean is examined, five schools are found to have percentages markedly higher than the others. The medical schools at Harvard, Cornell, Chicago (Pritzker), Rochester, and Yale all had unusually large fractions of deans among their alumni. Together these five schools granted M.D.s to 75 deans while having 16,005 living graduates at the end of 1967. These figures indicate that the alumni of these five schools were more than four times as likely to have served as dean in comparison with alumni of all other schools.

The 20 deans who did not hold an M.D. had Ph.D.s from U.S. universities. While the University of Minnesota-Minneapolis and Yale both granted Ph.D.s to three of these deans, no other school granted more than two.

TERRY BRYLL, *Division of Operational Studies, and* LYNN SUKALO, *Department of Institutional Development, both of the Association of American Medical Colleges, Washington, D.C.*

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preclinical and clinical years. Although comparisons are tenuous because of differences in data bases, it appears that there may have been a stabilization in the number of hours offered in the preclinical years since Webster's 1966 compilation. Webster combined the first- and second-year hours and reported an average of 96 hours, whereas the current study suggests only 87 hours in that category.

Over half (54 percent) of the coordinators sent additional material, such as lecture calendars, syllabi, and program descriptions, as requested. The high rate of submission may reflect a need or interest in sharing what they have developed and learning from the work of other coordinators.

It is encouraging that regardless of sex or type of graduate education, the curriculum coordinators reported a growing acceptance of behavioral science education by both students and faculty. On the other hand, however, it appears that data reflect a stabilization of time commitment and only a limited relationship between the time devoted to coordinating the behavioral science curriculum and the number of hours in or acceptance of that curriculum.

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Sex Differences in Medical Specialty Preferences

George H. Zimny, Ph.D., and Becky R. Shelton

The need for further investigation of the ways in which men and women medical students differ has been heightened by the recent substantial increase in the number of women students and by the possibility that women students are different from those of earlier years. Thomae-Forgues and Tonesk (1) pointed out that the total enrollment of women grew from 9,661 in 1974–75 to 16,141 in 1979–80, a 67.1 percent increase. During the same period, they reported the enrollment of men increased from 43,893 in 1974–75 to 47,637 in 1979–80, an increase of only 8.5 percent. McGrath and Zimet (2) concluded from their data that "faculty in medical schools and in subsequent specialty training settings and potential patients can increasingly expect women physicians who view themselves, and their specialty interests, differently from women physicians of the past."

The purpose of the present study was to investigate differences between men and women medical students in their preferences for medical specialties and for factors involved in the practice of medicine. Unlike other studies, the data reported here cover measured rather than stated preferences.

Method

The data consist of 46 preference scores obtained by 380 third-year medical students who voluntarily completed the Medical Specialty Preference Inventory (MSPI) (3, 4) in order to obtain information to use in planning their medical careers. The students were from five medical schools and included 287 men and 93 women.

The students completed the MSPI by rating each of 199 items on a seven-point scale ranging from 1 (low) to 7 (high) to indicate how desirable it is for them in the practice of medicine. The ratings provide an overall preference score for each of six specialties and a preference score for each of 40 factors. Analysis of variance was used to test the significance of sex differences on each of the 46 scores.

Dr. Zimny is professor of psychology, Department of Psychiatry, and Ms. Shelton is a second-year medical student, St. Louis University School of Medicine.

TABLE 1

Means and Standard Deviations of Preferences of Women and Men Third-Year Medical Students at Five Medical Schools

Specialty/Factor	Women ($n = 93$)		Men ($n = 287$)	
	Mean	S.D.	Mean	S.D.
Specialties*				
Medicine	65.44	6.98	68.20‡	7.70
Obstetrics-gynecology	67.86	6.50	65.69‡	7.18
Pediatrics	67.27	6.13	65.18‡	7.30
Psychiatry	54.92	7.95	52.80†	8.26
Surgery	63.06	8.83	66.28‡	8.99
Family medicine	65.24	9.69	67.10	10.77
Medical Practice Factors*				
Many major diseases	4.80	0.99	4.99	1.02
Infectious diseases	4.50	1.34	4.72	1.27
Incurable and disabling diseases	2.80	1.13	3.19‡	1.17
Neural functions	3.66	1.24	4.18‡	1.24
Reproductive functions	4.00	1.49	3.99	1.33
Complex problems	4.59	1.25	4.85†	1.14
Life-threatening problems	4.00	1.58	4.64‡	1.33
Psychosomatic problems	3.73	1.30	3.85	1.40
Intimate personal problems	4.14	1.50	4.27	1.55
Emotional reactions to illness	3.96	1.32	3.90	1.36
Older age patients	3.35	1.23	3.64	1.29
Child and adolescent patients	4.90	1.53	4.75	1.36
Dying patients	3.35	1.19	3.72‡	1.29
Many patients daily	4.02	1.19	3.97	1.21
Comprehensive care	4.72	1.23	4.67	1.37
Home health care	3.86	1.54	4.15	1.31
Preventive care	5.32	1.46	4.95†	1.35
Genetic counseling	3.76	1.58	3.49	1.29
Marital and sexual counseling	4.14	1.59	4.01	1.58
Family planning counseling	4.19	1.60	3.91	1.45
Discussion of personal relations	3.40	1.41	3.57	1.40
Patient participation	5.30	1.10	5.03†	1.07
Beneficial treatment results	5.39	0.99	5.48	0.96
Knowledge of skeletal and muscular systems	3.62	1.55	4.21‡	1.42
Knowledge of circulatory, respiratory, digestive, and excretory systems	4.12	1.23	4.64‡	1.16
Knowledge of anatomy and physiology	4.69	1.13	5.15‡	1.03
Extensive precise work-ups	4.84	0.84	4.94	0.84
Laboratory tests	5.02	0.94	5.28†	0.97
Proctoscopies and arteriograms	3.29	1.26	4.24‡	1.28
Complex equipment	3.45	1.35	4.14‡	1.48
Use of hands	5.40	1.21	5.56	1.09
Standard procedures	4.27	1.04	4.50	1.10
High risk procedures	2.81	1.16	3.36‡	1.37
Outpatient operative procedures	4.57	1.60	4.85	1.53
Family information	4.52	1.19	4.41	1.20
Socioeconomic information	4.04	1.18	4.08	1.25
Rehabilitation services	3.83	1.25	4.25‡	1.29
Social services	4.06	1.40	4.23	1.38
Psychological services	3.34	1.35	3.68†	1.51
Referrals and consultations	4.81	1.32	5.05	1.13

* Ranges of scores were 0 to 100 for specialties and 1.0 to 7.0 for medical practice factors. † $p = .05$. ‡ $p = .01$.

Results

Table 1 contains the mean and standard deviation of the 46 scores for the men and women students and the results of the tests of significance of differences. Men students had a significantly higher preference for internal medicine and surgery and women students for obstetrics-gynecology, pediatrics, and psychiatry. Men showed a significantly higher preference for 14 factors and women for 2 factors. Fifteen of these 16 factors appear to fall into five fairly distinct groups.

Among the factors on which the men scored significantly higher, one group consists of incurable and disabling diseases, life-threatening problems, complex problems, dying patients, and high risk procedures. This indicates that the men had a greater preference than the women for dealing with serious complex medical problems. A second group consists of three knowledge factors, indicating a greater preference by the men for the knowledge base employed in medicine. The third group of factors consists of laboratory tests, proctoscopies and arteriograms, and complex equipment. This suggests a greater preference by the men for complex technical procedures used in the practice of medicine. The last group contains the factors of rehabilitation services and psychological services, suggesting a greater preference by the men for these ancillary services; this preference may, in turn, be related to their greater preference for dealing with disabled and dying patients.

The two factors on which the women scored significantly higher were preventive care and patient participation. These factors as a group suggest a greater preference on the part of the women for giving patients responsibility for their own health care.

Discussion

The sex differences in preferences for medical specialties found here using measured preferences are similar in most respects to the results of other studies (2, 5) that used different ways of assessing preference or choice. The levels of preference for psychiatry by men and women, although significantly different, were very low in comparison with those for all other specialties. This finding holds little promise for resolution of the manpower problem in psychiatry (6).

The first three groups of factors for which the men showed a higher preference than the women, namely, serious complex problems, knowledge, and technical procedures, appear to underlie the men students' greater preference for internal medicine and surgery. The women students' greater preference for giving responsibility to patients could be considered as at least one basis for the women's greater preference for obstetrics-gynecology (woman's care of herself and her fetus), pediatrics (parents' care of their children), and psychiatry (patients' necessary involvement in solving their problems).

The groups of factors showing sex differences also have implications for the ways in which men and women may function during their residency training and in their practice, regardless of which specialty they enter. Men may be expected to be more cognitively and technically oriented and women more patient oriented. These are only general expectations because of individual differences in preferences among the men and among the women, but the expectations do promise diversity among physicians. Whether these expectations are borne out under the rigors of residency training and of practice is a question that warrants investigation.

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DATAGRAM

Results of the NRMP for 1982

The number of U.S. graduates (USG) who enrolled in the National Resident Matching Program (NRMP) in 1982 was 292 more than in 1981 (1). The percentage of the class who enrolled increased by two percentage points, and the number who subsequently withdrew decreased by 1 percentage point (Table 1). The proportion who were unmatched increased from 7.2 to 7.9 percent. Among the North American graduates (NAG), the number of "fifth pathway" applicants increased from 456 to 528; 430 participated in the match, and 75 percent were successful, compared with 76 percent of the Canadian graduates, 64 percent of the osteopathic graduates, and 61 percent of physician applicants.

TABLE 1

Participation in the National Resident Matching Program in 1982

Category	U.S. Students		North American Graduates*		Foreign Graduates		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Applicants	15,788	100	1,486	100	4,852	100	22,126	100
Withdrew	1,644	10	555	37	1,517	31	3,716	17
Active participants	14,144	90	931	63	3,335	69	18,410	83
Matched	13,023	92	639	69	1,287	39	14,949	81
Unmatched	1,121	8	292	31	2,048	61	3,461	19
Total	14,144	100	931	100	3,335	100	18,410	100

* North American graduates include graduating students from U.S. osteopathic schools; Canadian medical schools; physician candidates, that is, U.S. graduates who did not enter GME directly from medical school, and "fifth pathway" students, who are U.S. nationals who completed course requirements for a medical degree abroad followed by a year of clinical training in a U.S. hospital under medical school sponsorship.

The number of graduates of foreign medical schools (FMG) who applied increased by 2,336. Of the 4,852 who applied, 1,348 were U.S. citizens; the number of U.S. FMG increased by 72 percentage points, and the number of alien FMG doubled. The percentage of all FMG who matched decreased by 13 percentage points; 57 percent of U.S. FMG were matched, but only 31 percent of alien FMG obtained a position.

The total number of U.S. citizens (U.S. students, "fifth pathway," and U.S. FMG) who applied to the match this year increased by 6 percent.

The number of positions offered for the first postgraduate year decreased by 31; 127 more were offered in the generalist* specialties than in 1981 (Table 2). The ratio of positions per applicant was 0.8; that of positions per U.S. citizen applicant was 1.04, and that of positions per U.S. medical school graduate was 1.16; the ratios for active applicants in the match were, respectively, 0.99, 1.18, and 1.29.

The overall filling of positions increased by 5 percentage points; the filling of positions by U.S. graduates increased by 2 percentage points, and the filling by other applicants increased by 2 percentage points. The most competitive programs were in obstetrics, neurosurgery, orthopedic surgery, and otolaryngology; in all of these, over 90 percent of the positions were filled.

Only 30 more USG entered family practice programs than in 1981, but the filling of total positions increased by 4 percentage points be-

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* "Generalist" specialties are defined as family practice, internal medicine, obstetrics, and pediatrics.

TABLE 2

Positions Offered and Filled by Specialty and Type of Applicants in the NRMP in 1982

Specialties	Positions Offered		Applicants Matched											
			U.S. Students			North American Graduates‡			Foreign Graduates			Total		
				Percent			Percent			Percent			Percent	
	No.	Percent*	No.	*	†	No.	*	†	No.	*	†	No.	*	†
Family practice	2,362	13	1,757	13	74	74	12	3	109	8	5	1,940	13	82
Internal medicine	6,260	34	4,484	34	72	239	37	4	525	41	8	5,248	35	84
Pediatrics	1,810	10	1,203	9	66	56	9	3	216	17	12	1,475	10	81
Obstetrics	1,035	6	841	6	81	75	12	7	46	4	4	962	6	93
Psychiatry	922	5	541	4	59	17	3	2	45	3	5	603	4	65
Medical specialties	109	1	50	0	46	0	0	0	5	0	5	55	0	50
Dermatology	9		6		67	0		0	0		0	6		67
Neurology	72		30		42	0		0	5		7	35		49
Ophthalmology	28		14		50	0		0	0		0	14		50
General surgery	2,340	13	1,777	14	76	95	15	4	173	13	7	2,045	14	87
Surgical specialties	553	3	490	4	89	21	3	4	7	1	1	518	3	94
Neurosurgery	40		37		93	0		0	1		3	38		95
Orthopedics	305		287		94	14		5	1		0	302		99
Otolaryngology	96		87		91	3		3	0		0	90		94
Urology	107		75		70	4		4	5		5	84		79
Plastic surgery	5		4		80	0		0			0	4		80
Support specialties	1,566	9	881	7	56	30	5	2	83	6	5	994	7	63
Anesthesiology	507		343		68	12		2	28		6	383		76
Pathology	557		236		42	6		1	36		6	278		50
Physical medicine	92		36		39	2		2	3		3	41		45
Diagnostic radiology	336		251		75	10		3	10		3	271		81
Therapeutic radiology	72		15		21	0		0	6		8	21		29
Nuclear medicine	2		0		0	0		0			0	0		0
Flexible	1,343	7	999	8	74	32	5	2	78	6	6	1,109	7	83
Total	18,300	100	13,023	100	71	639	100	3	1,287	100	7	14,949	100	82

* Percent distributions of positions offered and filled among specialties (percentages may not add because of rounding).

† Percent filling of positions.

‡ See Table 1 footnote.

cause of the number of non-USG who matched. Internal medicine attracted 157 more USG than last year, and the filling of total positions increased by 5 percentage points despite the offering of 131 more positions, also because of the number of non-USG who matched.

In pediatrics, general surgery, flexible programs, and the support specialties, the numbers of positions offered decreased; and, with the exception of general surgery and anesthesiology, the numbers of USG who entered them also decreased. An increase of 11 percentage points of USG entering psychiatry occurred, thus continuing the increase that occurred last year.

The participation of programs and positions in the surgical specialties of orthopedic surgery, otolaryngology, and urology increased by one-third, and over 90 percent of the positions were filled by USG. A few programs in nuclear medicine and plastic surgery participated in the match for the first time.

The distribution of matched USG among types of programs increased somewhat in internal medicine, psychiatry, the surgical specialties, and anesthesiology and decreased slightly in pediatrics, flexible programs, and the other support specialties.

In the 1982 match, 72 programs offered an additional 170 positions as advanced student programs to be entered in July 1983 or 1984. Only 35 applicants matched to these positions; in the same match, 25 also matched to a first postgraduate year. Finally, 54 programs offered 124 positions to residents rather than students as advanced resident programs; none was filled.

Data that describe the trends in numbers of positions offered and filled by U.S. graduates and other applicants during the past several years are included in the 1982 *NRMP Directory* (2).

JOHN S. GRAETTINGER, M.D., *executive vice president, National Resident Matching Program; associate dean for graduate medical education, Rush-Presbyterian-St. Luke's Medical Center; and professor of medicine, Rush Medical College, Chicago.*

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1981-82 Enrollment in U.S. Medical Schools (Datagram)

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Family Practice as a Specialty Choice: Effect of Premedical and Medical Education

William D. Brearley, M.D., William Simpson, M.D., and Richard M. Baker, M.D.

Abstract—Identification of beneficial and detrimental parameters influencing the choice of family practice as a career was the object of the study reported here. Curriculum components and elements during or before medical school were examined. A questionnaire listing 18 factors that influenced specialty choice before residency training was completed by 134 first-year family practice residents. Participation in a family practice clerkship or preceptorship during the third and fourth years of medical school and association with family physicians during or before medical school were perceived as most beneficial. Generally, students' experiences during the first three years were perceived as detrimental to selecting family practice. Also, data indicated that 75 percent of the students select their specialty during years three and four. Medical schools wishing to increase the number of their graduates entering family practice should strongly consider requiring clinical rotations in family medicine and providing maximum exposure to family practice residents and faculty members as role models.

Medical specialty choice is a multifaceted, complex personal decision that has commanded great interest in medical education research in recent years. As the trend toward medical specialization accelerates, this area of interest becomes even more important (1). Previous studies relate medical student specialty preferences to personality characteristics, age, value systems, intellectual capabilities, and personal backgrounds. Another important aspect of specialty choice is the role of medical education in the decision-making process. This issue is addressed by the present paper, with the specialty of family practice as the focus.

The undergraduate medical curriculum is not a constant; it is, rather, a constantly evolving phenomenon. The problem of the distribution of physicians, in both a specialty and geographic sense, is being addressed by recent trends toward increasing the use of electives in medical school and toward more community orientation and primary care education (2). While the specialty distribution of physicians cannot be addressed solely by curricular changes, the curriculum may have some effect on the problem. The optimal curriculum would allow each student the greatest opportunity to develop his own interests and ability, whether in the area of primary care or the medical or surgical subspecialties.

Donovan and colleagues (3) found that

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39 percent of medical students maintained a consistent career choice, while 61 percent reported a major change in career preference between their sophomore and senior years. There appeared to be no differences in motivational, personality, or cognitive differences between the consistent and inconsistent groups. Held and Zimet (4) found that the certainty level of specialty choice among medical students increased dramatically with respect to level of training. They reported that 75 percent of medical students changed their choice between their first and fourth years. Although in the latter study a high initial certainty level correlated with a high percentage of students choosing family practice, student statements of specialty choice early in medical careers were generally unreliable predictors of their ultimate decision.

As the specialty of family practice has grown in popularity, so have the studies of the students choosing it (5–7). There appear to be significant personality and value differences among students entering respective specialties (8). Zimet and Held (9) found that student concepts of family practice changed little with various classes; it was held highest in "social attractiveness" though lowest in "status" throughout the four years. Moreover, the family practitioner was seen as a role model by all students, regardless of their own specialty choice. Students also rated themselves as having traits similar to those they attributed to family physicians, again regardless of their own specialty choice. Paiva and Haley (10) reported that students interested in family practice tended to come from small towns or rural areas, tended to have Protestant religious backgrounds with more emphasis on religious values than other students, were less exposed to medicine prior to medical school, and scored highest with respect to belief in the strength of patients' inner resources. Intellectually, their scores on the Medical College Admission Test (MCAT) were generally average. It has also been reported that most students who eventually go into family practice do not decide on attending medical school until late in the educational process, that is, during or after their undergraduate education (11). Family practice was also the only specialty in which men and women choosing it appeared to be quite similar in personality traits (12). As a general trend, these students planned to spend little time in teaching and research, and most planned to practice in relatively small communities (13).

The study on which this article is based examined the role of the curriculum in the subset of medical students who eventually chose family practice residencies in order to delineate which aspects of the educational process fostered or discouraged their interests in primary care. Such information could be beneficial to curriculum planners in answering the demand for primary care physicians (11).

Materials and Methods

The authors mailed a three-page questionnaire to first-year family practice residents in community hospital-based, military, and university medical center-based programs. The survey covered 19 residency programs, mostly in the southeast. A total of 134 residents responded for a response rate of 82 percent. The respondents represented a total of 64 medical schools in 32 states and Puerto Rico, and they equaled 5 percent of all first-year residents in family practice residencies in the United States during the 1980–81 academic year.

In addition to questions about demographic data and timing of decision to choose family medicine as specialty choice, the residents were asked to evaluate 18 factors that might have influenced their decision on specialty choice during predoctoral medical education. A five-point scale was used, enabling the resident to evaluate each factor from "definitely beneficial" to "definitely detrimental." Alternatively, the residents could indicate that the item did not apply, for example, if they did not elect or did not have available a preceptorship in the first or second year. The wording of the question was as follows: "How did the following parameters affect your choice of family practice as a medical specialty?"

Results

Demographic data revealed that 95 percent of the respondents were physicians, and 5 percent were osteopaths. There were 83 percent males and 17 percent females; 68 percent were married, while 28 percent were single, and three percent were divorced. The majority of the first-year residents, 59 percent, were 26 or 27 years old, and 52 percent were from hometowns with populations of less than 25,000.

The timing of the first-year residents' decision to enter the specialty of family practice in regard to the educational process was significant (Table 1). Fifty-eight percent stated that they had considered family medicine prior to medical school, and, indeed, almost half of that group had considered a career in family medicine prior to college. The decision definitely to enter this specialty was reserved until later in medical school; 75 percent made that commitment during the clinical years (40 percent in the third year and 34 percent in the fourth year), while only 11 percent stated that they had made a definite commitment during the preclinical years.

From the "beneficial" parameters in Table 2, it can be seen that exposure to family practice in the clinical years is most important, since preceptorships in the third and fourth years and the clerkship in family practice ranked first and second, respectively. In addition, association with family practice physicians is also important, as evidenced by three of the top seven being contact with family practice residents, hometown family doctor, and family practice faculty.

TABLE 1

Percentage of 134 First-Year Residents in Family Practice Reporting Preliminary and Definitive Career Decisions at Various Educational Phases Prior to Graduate Training

Educational Phases	Percent
First Consideration	
Before college	28.0
During college	29.5
Year 1 medical school	18.9
Year 2 medical school	6.1
Year 3 medical school	7.6
Year 4 medical school	7.6
Other	2.3
Definite Decision	
Prior to medical school	12.8
Year 1 medical school	7.5
Year 2 medical school	3.0
Year 3 medical school	40.6
Year 4 medical school	34.6
Other	1.5

Table 3 lists the rank order of parameters judged by respondents to be "detrimental." The percentages are adjusted to exclude those residents who marked "does not apply," since they likely meant that they had not had the opportunity to experience such things as a clerkship, preceptorship, and family practice club. This assumption is supported by the small numbers (less than 10 percent) marking "does not apply" for items all students experience (year 2 curriculum, for example), while the item, "clerkship in family practice," had 28 percent "does not apply."

Discussion

Positive influences on career choice for family practice proved to be those occasions in which the student could experience family practice and observe family physicians. The contact with family practice residents and faculty cannot be overemphasized. Also, the value of preceptorships in all years is striking. Preceptorships in the first two years did appear in the top

TABLE 2

Rank-Ordered Listing of Questionnaire Items According to the Percentage of First-Year Residents in Family Practice Rating Them as 'Beneficial Parameters' in Reaching a Career Decision

Rank	Parameter	Definitely Beneficial	Slightly Beneficial	Total
1	Preceptorship with a family physician during years 3 and 4	55	33	88
2	Clerkship in family medicine	44	37	81
3	Hometown family doctor	41	38	79
4	Contact with family practice residents	37	39	76
5	Preceptorship with a family physician during years 1 and 2	57	17	74
6	Year 4 curriculum	26	46	72
7	Contact with family practice faculty	33	33	66
8	Hometown	25	35	60
9	Year 3 curriculum	19	36	55
10	American Academy of Family Physicians membership	9	36	45
11	Religion	13	30	43
12	Parents	14	28	42
13	Spouse and children	2	33	35
14	Premedical education	8	26	34
15	Family practice club meetings	12	22	34
16	Peer group attitudes	4	30	34
17	Year 2 curriculum	5	23	28
18	Year 1 curriculum	4	23	27

TABLE 3

Rank-Ordered Listing of Questionnaire Items According to the Percentage of First-Year Residents in Family Practice Rating Them as 'Detrimental Parameters' in Reaching a Career Decision

Rank	Parameter	Definitely Detrimental	Slightly Detrimental	Total
1	Peer group attitudes	25	5	30
2	Year 2 curriculum	15	11	26
3	Year 1 curriculum	11	11	22
4	Year 3 curriculum	14	7	21
5	Contact with family practice faculty	8	3	11
6	Premedical education	7	3	10
7	Year 4 curriculum	7	3	10
8	Spouse and children	9	—	9
9	Parents	8	—	8
10	Hometown family doctor	4	2	6
11	Family practice club meetings	6	—	6
12	Hometown	5	1	6
13	Preceptorship with a family physician during years 1 and 2	4	—	4
14	Preceptorship with a family physician during years 3 and 4	4	—	4
15	Contact with family practice residents	3	1	4
16	American Academy of Family Physicians membership	3	—	3
17	Religion	3	—	3
18	Clerkship in family medicine	1	—	1

five parameters, even though a review of the data shows that 80 of the 134 respondents marked "does not apply" for that question. That meant that either the elective was not available or they did not take it. Of the 54 who did respond to the question, 57 percent said it was definitely beneficial. These findings are consistent with those of a study by the American Academy of Family Physicians, which showed a direct relationship between family practice as specialty preference and a preceptorship experience (14).

Negative influences on career choice for family practice were found to be: peer group attitudes and the traditional curriculum of predoctoral medical education. The "detrimental" influence of the medical school curriculum can be seen in Table 3. Three of the four most negatively evaluated parameters were the first three years of medical school curriculum. Since most residents surveyed attended "traditional" medical schools, they were reporting influences in the preclinical years and the third year (clerkships) as being opposed to their interest in family practice careers.

The timing of the students' decision definitely to enter family practice should encourage a family medicine curriculum during the first three years. The vast majority, 75 percent, made such a commitment during the third and fourth years of medical school, while a small minority, 13 percent, had made such a decision prior to entering medical school. In the latter group, the single greatest positive influence was the hometown family physician. Even more striking, of the 51 percent of students from hometowns with populations of less than 25,000, 71 percent stated that the single most positive influence was again the hometown family physician. This finding is substantiated by Oates, who also reports the significance of hometown size on specialty choice (15). Of those who made their specialty choice in the clinical years, preceptorships proved to be most valuable. The value of a family medicine preceptorship in clarifying career choice is also reported by Friedman and colleagues (16).

Implications

The implications of this study are important to all family physicians, whether in an academic environment or in private practice or in both. A major implication is that family physicians should never underestimate themselves as role models both for students interested in family practice and for all students who are interested in medicine. The potential for being a powerful influence is certainly present, and such opportunities should be taken seriously.

It appears that exposure to the principles and practice of family medicine in informal settings was more influential in career choice than formal "course work." Therefore, these contacts should be encouraged and expanded if medical students are to develop an interest in family medicine. Existing formal family medicine contacts should be restructured to allow more contact with individual family practice residents and faculty members. Required clinical rotations in family medicine during the third year or very early in the fourth year should be strongly considered for all medical schools wishing to increase the number of their students who enter family medicine.

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DATAGRAM

1981–82 Enrollment in U.S. Medical Schools

Total enrollment in the nation's medical schools continued to rise in 1981–82 but at a slower pace than in previous years. The total enrollment of 66,298, although the greatest absolute number of enrolled students to date, represented only a 1.7 percent proportional increase from the previous year. The corresponding proportional increases for 1980–81 and 1979–80 were 2.2 percent (65,189 enrolled) and 2.5 percent (63,800 enrolled) respectively. The growth in 1981–82 depicts the smallest change in six years of successively diminishing proportional increases in total enrollment. The stabilization of class sizes at established U.S. medical schools and the lack of new school openings since 1979 have contributed to the leveling off of enrollment totals.

In the fall of 1981, medical schools were asked for the first time to report new entrants to the first year as a distinct group in the annual Fall Enrollment Survey of the Association of American Medical Colleges (AAMC). The reported total of 16,644 new entrants differs from first-year enrollees (17,268), since it is restricted to those students entering medical school for the first time. Total first-year enrollment figures include first-year new entrants and students repeating or reentering the initial year of medical school. In addition, students continuing the first year as participants in special programs are included in this category. The increased flexibility of some medical school curricula permits students to extend the customary first-year program beyond a single year.

Trends in the size and make-up of first-year new entrants cannot be analyzed since comparable data from previous years are not available. However, data on new entrants will continue to be collected annually, thereby allowing for future trend studies.

Although the size of both first-year and total medical school enrollments has demonstrated little change, the composition of the medical student population has shifted noticeably. Over the past four years, the proportion of women studying medicine has shown consistent increases of about 7 percent each year. In 1981–82, a total of 18,505 women medical students were enrolled compared with 17,248 in 1980–81. Overall, women held 27.9 percent of the places in the nation's medical schools in 1981–82 in contrast to 23.7 percent four years earlier. The percentage of women enrolled in the 1981–82 first-year class approached the one-third mark at 30.8 percent (5,317 women) in contrast to 28.9 percent (4,966 women) in 1980–81 and 25.6 percent (4,130 women) in 1977–78.

The total number of underrepresented minorities enrolled in the 126 medical schools in 1981–82 was 5,503, or 8.3 percent of the total enrollment. There were 1,422 underrepresented minority medical students in the entering class, representing 8.6 percent of all new entrants in the 1981–82 academic year.

In the 1981–82 administration of the enrollment survey, the instructions were changed to include students holding permanent resident visas with U.S. citizens. This change in classification aligned the AAMC's approach with the designation used by the majority of the schools. Previously, these individuals were recorded as foreign students. As a result of the reclassification, the number of foreign students reported for 1981–82 exhibited a sizable decrease; those with permanent resident visas were distributed among the racial/ethnic breakdowns of the U.S. citizen category. This fact and the possibility of independent changes in the sizes of the various U.S. citizen subgroups confound any strict comparison of the information for underrepresented minorities and other racial/ethnic groups between the current and previous years. This is especially true where the magnitude of change in 1981–82 is relatively small. Only in the case of the Asian or Pacific Islander category does the increase appear large enough to suggest that it was elevated appreciably by the inclusion of students holding permanent resident visas. Changes in other relevant categories are quite small and make inferences concerning important shifts in the prevailing trends inadvisable.

Susan N. Sherman, *research associate,* Xenia Tonesk, Ph.D., *program director, and* James B. Erdmann, Ph.D., *director, Division of Educational Measurement and Research, Association of American Medical Colleges, Washington, D.C.*

TABLE 1

U.S. Medical School Enrollment for 1981–82

Racial/Ethnic Group	First-Year New Entrants				First-Year Enrollment*				Total Enrollment			
	Men	Women	Total	Percent of Total	Men	Women	Total	Percent of Total	Men	Women	Total	Percent of Total
U.S. Citizens†												
White	9,760	4,135	13,895	83.5	9,991	4,227	14,218	82.4	41,308	14,893	56,201	84.8
Underrepresented Minorities												
Black	554	430	984	5.9	679	517	1,196	6.9	2,166	1,718	3,884	5.9
American Indian or Alaskan Native	46	18	64	0.4	51	19	70	0.4	166	63	229	0.3
Mexican American/Chicano	194	83	277	1.7	209	91	300	1.8	747	293	1,040	1.6
Puerto Rican (mainland)	56	41	97	0.6	59	46	105	0.6	211	139	350	0.5
Subtotal	850	572	1,422	8.6	998	673	1,671	9.7	3,290	2,213	5,503	8.3
Other U.S. Groups												
Asian or Pacific Islander	493	254	747	4.5	508	257	765	4.4	1,731	787	2,518	3.8
Puerto Rican (Commonwealth)	169	72	241	1.4	176	74	250	1.5	569	287	856	1.3
Other Hispanic	174	58	232	1.4	185	62	247	1.4	612	235	847	1.3
Subtotal	836	384	1,220	7.3	869	393	1,262	7.3	2,912	1,309	4,221	6.4
Foreign Students												
Black	11	5	16	0.1	15	7	22	0.1	54	26	80	0.1
Other	72	13	85	0.5	75	14	89	0.5	226	60	286	0.4
Subtotal	83	18	101	0.6	90	21	111	0.6	280	86	366	0.5
Unidentified	3	3	6	‡	3	3	6	‡	3	4	7	‡
Grand Total§	11,532	5,112	16,644	100.0	11,951	5,317	17,268	100.0	47,793	18,505	66,298	100.0

Source: 1981–82 AAMC Fall Enrollment Survey. Reflects enrollments as of October 16, 1981, at all 126 schools.

* First-year enrollment includes new entrants and those repeating, reentering, or continuing the initial year.

† Foreign students with permanent resident visas are included with U.S. citizens.

‡ Less than 0.1 percent.

§ The percentage of women enrolled in 1981–82 as first-year new entrants, first-year enrollees, and total enrollees were 30.7, 30.8, and 27.9 respectively.

TABLE 2

First-Year U.S. Medical School Enrollment, Men and Women*

Sex	1977–78 (120 Schools)		1978–79 (124 Schools)		1979–80 (126 Schools)		1980–81 (126 Schools)		1981–82 (126 Schools)	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Men	12,006	74.4	12,339	74.8	12,217	72.2	12,220	71.1	11,951	69.2
Women	4,130	25.6	4,162	25.2	4,713	27.8	4,966	28.9	5,317	30.8
Total	16,136	100.0	16,501	100.0	16,930	100.0	17,186	100.0	17,268	100.0

* First-year enrollment includes new entrants and those students repeating, reentering, or continuing the initial year.

TABLE 3

First-Year U.S. Medical School Enrollment by Racial/Ethnic Group and Citizenship*

Racial/Ethnic Group	1977–78		1978–79		1979–80		1980–81		1981–82†	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
U.S. Citizens										
White	13,732	85.1	14,048	85.1	14,259	84.2	14,262	83.0	14,218	82.4
Underrepresented Minorities										
Black	1,085	6.7	1,061	6.4	1,108	6.5	1,128	6.6	1,196	6.9
American Indian or Alaskan Native	51	0.3	47	0.3	63	0.4	67	0.4	70	0.4
Mexican American/Chicano	246	1.6	260	1.6	290	1.7	258	1.5	300	1.8
Puerto Rican (mainland)	68	0.4	75	0.5	86	0.5	95	0.5	105	0.6
Subtotal	1,450	9.0	1,443	8.8	1,547	9.1	1,548	9.0	1,671	9.7
Other U.S. Groups										
Asian or Pacific Islander	395	2.4	452	2.7	502	3.0	572	3.3	765	4.4
Puerto Rican (Commonwealth)	144	0.9	179	1.1	226	1.3	241	1.4	250	1.5
Other Hispanic	157	1.0	151	0.9	188	1.1	224	1.3	247	1.4
Subtotal	696	4.3	782	4.7	916	5.4	1,037	6.0	1,262	7.3
Foreign Students	258	1.6	228	1.4	208	1.3	339	2.0	111	0.6
Unidentified	—	—	—	—	—	—	—	—	6	‡
Grand Total	16,136	100.0	16,501	100.0	16,930	100.0	17,186	100.0	17,268	100.0

* First-year enrollment includes new entrants and those students repeating, reentering, or continuing the initial year.

† In 1981–82, the definition of U.S. citizens was expanded to include students holding permanent resident visas. These individuals were previously recorded as foreign students. This reclassification means that the U.S. citizen categories absorbed the decrease noted in the foreign subtotal between 1980–81 and 1981–82.

‡ *Less than 0.1 percent.*

TABLE 4

Total U.S. Medical School Enrollment, Men and Women

Sex	1977–78 (120 Schools)		1978–79 (124 Schools)		1979–80 (126 Schools)		1980–81 (126 Schools)		1981–82 (12[illegible] Schools)	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Men	45,821	76.3	47,111	75.7	47,651	74.7	47,886	73.5	47,793	72.1
Women	14,218	23.7	15,102	24.3	16,149	25.3	17,248	26.5	18,505	27.9
Total	60,039	100.0	62,213	100.0	63,800	100.0	65,189*	100.0	66,298	100.0

* Total includes 55 students from whom gender was not reported.

TABLE 5

Total U.S. Medical School Enrollment by Racial/Ethnic Group and Citizenship

Racial/Ethnic Group	1977–78		1978–79		1979–80		1980–81		1981–82*	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
U.S. Citizens										
White	51,974	86.6	53,720	86.4	54,854	86.0	55,434	85.0	56,201	84.8
Underrepresented Minorities										
Black	3,587	6.0	3,537	5.7	3,627	5.8	3,708	5.7	3,884	5.9
American Indian or Alaskan Native	201	0.3	202	0.3	212	0.3	221	0.3	229	0.3
Mexican American/Chicano	831	1.4	882	1.4	964	1.5	951	1.5	1,040	1.6
Puerto Rican (mainland)	261	0.4	277	0.4	283	0.4	329	0.5	350	0.5
Subtotal	4,880	8.1	4,898	7.8	5,086	8.0	5,209	8.0	5,503	8.3
Other U.S. Groups										
Asian or Pacific Islander	1,422	2.4	1,592	2.6	1,777	2.8	1,924	3.0	2,518	3.8
Puerto Rican (Commonwealth)	532	0.9	617	1.0	700	1.1	798	1.2	856	1.3
Other Hispanic	426	0.7	489	0.8	567	0.9	683	1.0	847	1.3
Subtotal	2,380	4.0	2,698	4.4	3,044	4.8	3,405	5.2	4,221	6.4
Foreign Students	805	1.3	897	1.4	794	1.2	1,086	1.7	366	0.5
Unidentified	—	—	—	—	22	†	55	0.1	7	†
Grand Total	60,039	100.0	62,213	100.0	63,800	100.0	65,189	100.0	66,298	100.0

* In 1981–82, the definition of U.S. citizens was expanded to include students holding permanent resident visas. These individuals were previously recorded as foreign students. This reclassification means that the U.S. citizen categories absorbed the decrease noted in the foreign subtotal between 1980–81 and 1981–82.

† Less than 0.1 percent.

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State Retention of Medical School Graduates

Douglas E. Hough, Ph.D., and William D. Marder

Abstract—State governments support medical schools in their states for various reasons. A major reason is the perception that graduates tend to practice in the state where they attend medical school. In a study reported here, the authors examined this assumption by investigating the experience of physicians currently active in medical practice. The entire population of active U.S. physicians who graduated from U.S. medical schools was examined, as well as four selected cohorts of U.S. medical school graduates, using the American Medical Association's Physician Masterfile. The ability of states to retain their medical school graduates is related to physician characteristics (age, medical school, and practice specialty) as well as to state characteristics (population, physician-to-population ratio, and per capita income). The results indicate that, overall, the argument that states should support medical schools in order to ensure an adequate supply of physicians is less compelling than in the past, for reasons often beyond the control of the individual states.

State government officials have offered a variety of reasons for building or supporting medical schools. First, they may perceive medical schools to be symbols of state pride or progress. Second, the state may want to accept part of the public responsibility for contributing to the body of medical knowledge by funding research in a university setting. Third, medical schools may be viewed as a method of increasing the supply of medical care to the state's citizens through the use of university hospitals. Finally, state officials may consider medical schools to be the best vehicles for ensuring an adequate number of practicing physicians in the state—both from their own graduates and from the influx of out-of-state physicians who are attracted by the presence and availability of medical school facilities.

In an environment of federal cutbacks, declines in traditional state revenue sources, and increased competition for government funds, state governments must reassess their reasons for supporting undergraduate medical education. The authors in this paper examine the extent to which one of these reasons—increased physician supply through retention of medical school graduates—continues to be a legitimate basis for an individual state's support of medical education. The study utilizes the Physician Masterfile created by the American Medical Association (AMA) to determine the migratory patterns of the physician population as a whole. Four cohorts of medical school graduates are also studied. The migratory patterns are related to the characteristics of those physicians and of the states in which they practice.

Dr. Hough and Mr. Marder are research economists, Center for Health Policy Research, American Medical Association, Chicago. The conclusions and opinions expressed in this paper do not necessarily reflect the official position of the American Medical Association.

Previous Work

Various studies have analyzed the relationship between medical schools and location of physician practice. In their classic study of eight medical school graduating classes in 1915–1950, Weiskotten and colleagues (1) found that between 45 percent and 56 percent of the U.S. medical school graduates practiced in the same state as their school of graduation; they found that a substantially higher percentage of graduates of private medical schools migrated than public medical school graduates. Mason (2), also using the cohort approach, determined from AMA data that 43 percent of the 6,831 U.S. medical school graduates of 1960 were practicing in the same state as their school of graduation as of 1975.

In a more analytic context, Yett and Sloan (3) showed for 1965 graduates that graduation from a medical school in a state significantly increased the probability of practicing in the state; further state contact, for example, birth, internship, and/or residency in the state, substantially enhanced this probability. Wilensky (4) and Stefanu and colleagues (5) also confirmed this result for samples of medical school graduates in Michigan and Texas, respectively. Wilensky, for example, found that 42 percent of her sample of physicians graduating from Michigan medical schools in either 1960, 1965, or 1968 were practicing in the state in 1975.

Clearly, factors other than prior contact with a state influence practice location decisions. Yett and Sloan determined through regression analysis that climate, state medical licensure examination failure rate, and state per capita income were significant variables in this regard. Wilensky's analysis indicated that the important elements included climate, relative physician income, relative net migration, and the physician's perceived ability to obtain hospital privileges. These results in total yield two implications pertinent to the present study: (*a*) the presence of medical schools affects the number of physicians in a state; and (*b*) any analysis of this issue must consider both physician and state characteristics.

Physician Characteristics

Since 1906 the American Medical Association has maintained a Physician Masterfile containing professional and practice-related information on all physicians in the United States. The Masterfile has evolved from a simple record-keeping device for membership and mailing purposes to a file that can be used for a variety of AMA activities. Today the file contains "the most comprehensive and complete source of physician data in the United States" (6); information is continually updated on the physicians in this country and on those graduates of American medical schools who are temporarily practicing overseas. (Available elsewhere is more complete information on the Masterfile itself [6] as well as evaluations of the quality of the data collected [7].) The data presented in this paper came from the Physician Masterfile as of December 31, 1979. Because the study on which this paper is based was concerned with how many physicians currently practice in the state where they graduated from medical school, three categories of physicians were excluded from the analysis: (*a*) inactive physicians and physicians with unknown addresses; (*b*) resident physicians; and (*c*) graduates of foreign medical schools who were practicing in the United States.

Table 1 displays the distribution of all U.S.-trained physicians and relates current practice location to state of medical degree. This distribution is broken down into six categories: sex, type of medical school attended, reputation of medical school, practice specialty, age, and number of years since graduation from medical school. Of the 270,606 U.S. medical school graduates practicing as of the end of 1979, 39.9 percent (108,061) worked in the same state in which they received their medical degree; in other words, on average, states retained only two of every five physicians trained within their borders. There is no statistically significant difference in state retention between male and female physicians; the proportions moving from the state of their medical degree were 60.1 percent and 59.7 percent, respectively.

Significant differences are apparent with respect to medical school characteristics. In 1979, 47.7 percent of the 131,124 graduates of U.S. public medical schools were practicing in the same state, whereas only 32.7 percent of those who graduated from private medical schools were doing so. This higher propensity to move on the part of private school graduates suggests that support of public medical schools may be more effective in state retention than support to private schools. Table 1 also differentiates medical schools with respect to "reputation," which is defined here by the survey results of Cole and Lipton (8). (This study has generated substantial controversy, particularly over whether "reputation" is equivalent to "quality." These arguments notwithstanding, the Cole and Lipton ranking is used here, in part, because it has been corroborated by other studies [9].) A higher percentage of those who attended "elite" U.S. medical schools (that is, the 10 schools receiving the highest score in the Cole and Lipton study) moved out-of-state compared with those graduating from "non-elite" schools—65.9 percent versus 59.1 percent, respectively.

These two school characteristics—public versus private and "elite" versus "non-elite"—exhibit a curious interaction (not shown in table). Controlling for school reputation, the public/private dichotomy still holds; but the "elite"/"non-elite" distinction reverses itself when type of school is held constant. As a result, in ascending order, state retention was lowest for graduates of the eight "elite," private medical schools (27.7 percent), next for graduates of "non-elite," private medical schools (33.9 percent), followed by graduates of "non-elite," public schools (47.2 percent), and highest for graduates of the two "elite," public medical schools (53.7 percent).

The tendency for a physician to migrate from the state where he graduates from medical school can also be distinguished by practice specialty. Table 1 indicates that physicians in general/family practice or obstetrics/gynecology remained in their graduating states at a frequency much higher than the average physician. On the other hand, a higher proportion of psychiatrists and physicians in "other" specialties (primarily pathology) moved. This pattern implies, somewhat crudely, that state retention of medical school graduates is higher if their graduates choose primary care specialties over nonprimary care specialties.

Finally, Table 1 shows the influence of age and experience on physician migration. Except for the youngest age category (those under 30 years old), the percentage of medical school graduates practicing in the same state rose with age. (A similar, but not monotonic, pattern arises with the length of time since graduation.) In other words, older physicians were more likely to be practicing in the states where they graduated from medical school. Two explanations are available: either older physicians were moving back to where they attended medical school or the geographic mobility of physicians increased over time.

Table 2 offers some insights on this is-

TABLE 1

Number and Percentage of U.S. Medical School Graduates Who Practice in State of Medical Degree, by Physician Characteristics, 1979

Characteristic	Practicing in Same State		Not Practicing in Same State	
	No.	Percent	No.	Percent
All physicians	108,061	39.9	162,545	60.1
Sex				
Male	100,838	39.9	151,836	60.1
Female	7,223	40.3	10,709	59.7
Type of medical school*				
U.S. public	62,501	47.7	68,623	52.3
U.S. private	45,560	32.7	93,922	67.3
Reputation of medical school*				
"Elite"	12,624	34.1	24,360	65.9
"Non-elite"	95,437	40.9	138,185	59.1
Practice specialty*				
General or family practice	22,031	50.1	21,988	49.9
Internal medicine	20,359	38.1	33,092	61.9
Surgery	22,516	38.6	35,748	61.4
Pediatrics	6,454	37.4	10,797	62.6
Obstetrics-gynecology	6,666	42.5	9,022	57.5
Radiology	5,308	37.5	8,835	62.5
Psychiatry	7,068	36.7	12,174	63.3
Anesthesiology	3,390	39.1	5,287	60.9
Other	11,598	35.6	20,969	64.4
Unclassified	2,671	—	4,633	—
Age*				
<30	3,709	42.9	4,935	57.1
30–39	30,134	37.1	51,010	62.9
40–49	26,092	39.7	39,682	60.3
50–59	24,830	40.9	35,861	59.1
60–69	16,043	41.8	22,316	58.2
≥70	7,253	45.4	8,741	54.6
Years since medical school graduation*				
<10	24,834	39.3	38,329	60.7
10–19	28,178	38.6	44,838	61.4
20–29	24,554	40.9	35,457	59.1
30–39	18,688	39.2	29,037	60.8
40–49	9,499	43.6	12,311	56.4
≥50	2,308	47.3	2,573	52.7

* $p < .0001$.

sue. It shows the percentage of physicians who practice in the state where they attended medical school for four graduating classes: 1940, 1950, 1960, and 1970. These physician cohorts allow one to begin to evaluate both life-cycle and long-term environmental effects on physician migration. For instance, it is evident from the table that the physicians who were earliest in their careers (the class of 1970) had the lowest propensity to stay in-state of all the classes shown; this result is true for every category except for physicians who specialized in radiology, psychiatry, and "other." This pattern does not seem to be a life-cycle phenomenon. If it were, the earlier classes would have steadily increasing propensities to stay. However, physi-

TABLE 2

Percentage of U.S. Medical School Graduates Who Practice in State of Medical Degree, by Physician Characteristics and Year of Graduation, 1979

Characteristic	Percentage of Class			
	1940	1950	1960	1970
All physicians	40.8	38.4	41.0	34.0
Sex				
Male	41.0	38.8	41.0	33.9
Female	37.9	35.5	40.6	34.9
Type of medical school				
U.S. public	49.7†	47.6†	50.9†	41.1†
U.S. private	34.7	31.2	31.4	25.7
Reputation of medical school				
"Elite"	36.1*	35.3	33.2†	28.7†
"Non-elite"	41.8	39.0	42.2	34.8
Practice specialty				
General or family practice	47.5†	45.7†	55.2†	45.2†
Internal medicine	38.6	36.4	37.8	32.4
Surgery	41.0	38.5	38.8	33.1
Pediatrics	39.3	37.1	41.3	28.6
Obstetrics-gynecology	46.7	43.8	44.3	41.5
Radiology	33.6	37.2	39.6	34.3
Psychiatry	33.6	34.5	41.1	35.6
Anesthesiology	33.8	33.0	42.7	29.8
Other	34.9	30.5	33.6	31.4

*$p < .05$.
†$p < .0001$.

cians in the class of 1960 (rather than older physicians) exhibited the highest inclination to stay in the state where they graduated for nine of the 16 categories shown (overall, female physicians, graduates from U.S. public medical schools, graduates from "non-elite" medical schools, and specialists in general/family practice, pediatrics, radiology, psychiatry, and anesthesiology).

When each of the categories is viewed separately, there seems to exist no apparent trend in state retention of medical school graduates overall, except for the dramatic decrease for the class of 1970. As with the entire physician population, there were no statistically significant differences in migration between male and female physicians for any of the physician cohorts but only a narrowing of the already small differences.

Some curious differences are apparent with respect to the medical school characteristics of those who remained in the state. As before, graduates from public and private medical schools differed greatly in terms of out-of-state migration, the most dramatic difference being between the 50.9 percent state retention of 1960 public medical school graduates versus the 25.7 percent retention rate of 1970 private medical school graduates. It also is evident that medical school reputation was a significant correlate with state retention for the classes of 1960 and 1970, but not for the class of 1950 and only barely so for the class of 1940. In all cases, however, the direction of difference was consistent, with graduates of "elite" schools being more likely to move out-of-state than graduates of "non-elite" schools.

Finally, each of the cohorts exhibited a statistically significant difference among practice specialties. However, the specific specialty rankings differed among the graduating classes. For all the graduating classes shown in Table 2, general/family practice and obstetrics/gynecology were the two specialties with the highest rate of state retention. However, the two specialties with the highest rate of out-of-state migration varied widely: radiology and psychiatry (class of 1940); anesthesiology and other (class of 1950); internal medicine and other (class of 1960); and anesthesiology and pediatrics (class of 1970). As a result, few conclusions can be drawn from these data about the trend in migration of specialists.

State Characteristics

The retention of physicians in the state where they attended medical school de pended not only on the characteristics of the physicians but also on the characteristics of the state itself—its size, its wealth, and the number of physicians already there. Tables 3 and 4 extend the previous section by examining state retention rates relative to three potentially important state characteristics, as of 1979: state population, state physician-to-population ratio, and state per capita income. The states are arranged in quintiles, from the lowest 10 states to the highest 10 states in each category.

As with Table 1, Table 3 displays the state retention experience for all practicing U.S.-trained physicians. It is apparent that a state's size (in terms of population) made a dramatic difference in its ability to retain the physicians trained in its medical schools. The smallest states (of the ones that had medical schools) were able to keep only 10 percent of those who graduated from their schools, compared with the nationwide average of 40 percent.

This result suggests that the small states that maintain public medical schools may consider other strategies to attract a larger physician population. Several small states have already done this. Of the 15 smallest states in terms of population, six (Alaska, Wyoming, Delaware, Montana, Idaho, and Maine) have no medical school. Alaska, Montana, and Idaho have developed a cooperative arrangement with the University of Washington School of Medicine (the WAMI Program), and Maine has subsidized medical schools elsewhere in New England that admit students from Maine.

As to the other states, there appeared to be a slight trend in favor of higher retention of medical school graduates in the more populous states. This trend is not consistent among all five population cate-

TABLE 3

Number and Percentage of U.S. Medical School Graduates Who Practice in State of Medical Degree, by State Characteristics, 1979

Characteristic	Practicing in Same State		Not Practicing in Same State	
	No.	Percent	No.	Percent
All physicians	108,061	39.9	162,545	60.1
State population*				
Lowest 20 percent	1,191	10.2	10,545	89.8
Second 20 percent	5,040	33.5	10,028	66.5
Third 20 percent	13,333	43.4	17,391	56.6
Fourth 20 percent	26,735	36.2	47,165	63.8
Highest 20 percent	61,762	44.4	77,416	55.6
State physician-population ratio*				
Lowest 20 percent	7,420	47.7	8,147	52.3
Second 20 percent	12,597	41.3	17,894	58.7
Third 20 percent	28,511	41.4	40,401	58.6
Fourth 20 percent	25,253	37.4	42,302	62.6
Highest 20 percent	34,280	38.9	53,801	61.1
State per capita income*				
Lowest 20 percent	9,017	41.1	12,949	58.9
Second 20 percent	14,287	38.1	23,240	61.9
Third 20 percent	28,514	42.7	38,322	57.4
Fourth 20 percent	34,718	38.4	55,664	61.6
Highest 20 percent	21,525	39.9	32,370	60.1

* $p < .0001$.

gories; however, the 10 largest states were able to keep the highest percentage (44 percent) of those who graduated from medical schools within their borders.

The second statewide category—physician-to-population ratio—implies that low physician density states may find medical schools to be effective devices for enhancing physician supply. There was an inverse relationship between a state's physician-to-population ratio and its ability to retain its medical school graduates. The states with the fewest physicians per 1,000 population as of 1979 were able to keep over 47 percent of their graduates, compared with 39 percent for states with the highest physician density. This reasonably consistent pattern suggests that the high-density states act, in part, as suppliers of trained physicians for the low-density states. Although this result does not take into account other important factors, it does seem consistent with classic location theory and the notion of economically viable market areas for physicians (10).

Finally, Table 3 demonstrates the medical school graduate retention experience of states by per capita income. Although the chi-square statistic indicates that there existed a significant difference among the income categories, there was no apparent trend one way or the other. This absence of a significant pattern is, in itself, significant. It implies that the "poorest" states did not necessarily have a greater problem than wealthier states with retaining graduates of their medical schools. That is, "poor" states did not act as training grounds for the future physicians of other states.

Table 4 completes the analysis by displaying state retention patterns by state characteristics for the four physician cohorts examined earlier. This table yields

TABLE 4

Percentage of U.S. Medical School Graduates Who Practice in State of Medical Degree, by State Characteristics and Year of Graduation, 1979

Characteristic	Percentage of Class			
	1940	1950	1960	1970
All physicians	40.8	38.4	41.0	34.0
State population				
Lowest 20 percent	11.3†	8.6†	8.7†	6.4†
Second 20 percent	22.4	31.5	35.6	35.1
Third 20 percent	41.1	42.4	47.8	41.5
Fourth 20 percent	36.1	37.0	39.8	31.7
Highest 20 percent	47.7	42.0	43.5	35.6
State physician-population ratio				
Lowest 20 percent	53.1*	50.4†	48.5†	47.9†
Second 20 percent	37.6	40.7	49.5	38.1
Third 20 percent	42.7	43.9	43.1	33.5
Fourth 20 percent	39.2	33.7	38.2	31.2
Highest 20 percent	40.4	35.2	37.1	32.0
State per capita income				
Lowest 20 percent	35.4*	42.8*	45.1†	41.4†
Second 20 percent	34.0	38.7	44.5	33.4
Third 20 percent	45.9	41.2	45.1	38.4
Fourth 20 percent	41.6	37.0	38.2	29.4
Highest 20 percent	39.8	35.2	35.9	33.2

*$p < .01$.
†$p < .0001$.

several insights not evident in Table 3. First, the state retention rate fell dramatically for both the least populous states and the most populous states: from 11.3 percent (class of 1940) to 6.4 percent (class of 1970) for the lowest quintile and from 47.7 percent (class of 1940) to 35.6 percent (class of 1970) for the highest quintile. This pattern was not evident in the other population categories. Thus, both the largest and the smallest states had increasing difficulty retaining their medical school graduates.

Second, although Table 3 indicates that the most populous states had the highest retention rates overall, Table 4 shows that this conclusion did not hold for the individual cohorts. Only for the class of 1940 did the largest states retain the highest percentage of their medical school graduates; for the other three cohorts, this distinction was held by the medium-sized states (and by substantial margins for the classes of 1960 and 1970). Thus, again it appears that these states had the advantage in terms of state retention.

Third, the overall pattern of state retention relative to a state's physician-to-population ratio shown in Table 3 is most apparent in Table 4 for the classes of 1960 and 1970. This may indicate that younger physicians were responding more dramatically to those changes in market areas reflected by physician-to-population ratios. This behavior might also be evidenced by the dramatic dropoff in state retention between the classes of 1960 and 1970 for all categories except for those states with the lowest physician-to-population ratio.

Finally, this table reveals that an inverse relationship existed between state retention and per capita income for the classes of 1960 and 1970, a result not evident overall. As a result, the "poorest" states did not experience the recent drop in retention of medical school graduates that the "richer" states had. This suggests that public support of medical education in these states may continue to be a viable method for attracting practicing physicians.

Conclusions

As stated earlier, many states support undergraduate medical education to help ensure an adequate supply of physicians within their borders. The authors have investigated the factors that influence the retention of medical school graduates within the same state. Unlike much of the literature on the relationship between medical school and subsequent physician practice location, the study reported here covered the behavior of all physicians practicing in the United States who had graduated from U.S. medical schools. It also included the location behavior of four physician cohorts chosen to reflect both life-cycle and environmental changes.

The data presented here suggest the following conclusions:

1. In terms of state retention, public support of public medical schools appears more effective than public support of private medical schools.
2. Given the limited information available on medical school quality, it appears that state retention would be increased by improving the reputation of the state's public medical schools but not that of its private medical schools.
3. To increase retention of their graduates within the state, medical schools might do well to emphasize primary care specialization.
4. The smallest states (in terms of population) have little expectation of retaining their medical school graduates.
5. States with the lowest physician-to-population ratios have the highest retention rates.
6. Contrary to expectations, states with the lowest per capita income are not at a

disadvantage with respect to state retention.

These conclusions suggest that state officials may wish to reexamine the bases of their support for medical education. Although the situations in particular states differ, the results found here imply that the physician supply argument for building or supporting medical schools may be less compelling than in the past, for reasons beyond the control of the states.

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DATAGRAM

Major Sources of U.S.-Trained M.D.s on U.S. Medical School Faculties

The number of active graduates of U.S. medical schools as of December 31, 1979, according to the American Medical Association's Physician Masterfile, was 324,045, an increase of 57,034 since 1973. The Association of American Medical Colleges' Faculty Roster System reports that 22,677 (7 percent) of these graduates were serving as full-time faculty members at U.S. medical schools on that date. The percentage of M.D. alumni with faculty appointments was roughly equivalent to that of 1968–69 and 1975. (See datagrams in the September 1970 and November 1975 issues of the *Journal of Medical Education.*) The percentage of graduates who had ever received faculty appointments at U.S. medical schools was, of course, greater than 7 percent, as that percentage encompasses only those individuals who were faculty members as of December 31, 1979.

Through the Faculty Roster System, it is possible to identify those schools that are unusually significant sources of faculty members and where orientation toward academic careers appears to be especially strong.

The data are approached in two forms. Table 1 presents the schools ranked by the number of alumni who were full-time faculty members at any U.S. medical school. Table 2 presents schools ranked by the fraction of the graduates who had full-time faculty appointments at schools other than the graduating institution.

Generally, the large and long-established schools produced the greatest number of graduates who had become faculty members. The five schools which produced the largest number of faculty members, Harvard Medical School, Columbia University College of Physicians and Surgeons, University of Pennsylvania School of Medicine, New York University School of Medicine, and Johns Hopkins School of Medicine, remained the same over the 1968–69 to 1979–80 period, providing 4,016 of the active M.D. faculty members in 1979–80.

The lists are dominated by East Coast schools, joined by a few institutions in the Midwest and South. Stanford University School of Medicine is the only western school on either list. In part, this is due to the fact that western schools are younger and have had fewer graduates, and it also may reflect regional recruiting patterns.

Table 1 provides the number and the percentage of alumni with faculty appointments at their graduating institution and the number of alumni receiving appointments at other medical schools. The medical schools having the highest fraction of their alumni faculty with academic appointments at their own institution were those at the University of Minnesota-Minneapolis, Indiana University, University of Michigan, University of Texas-Galveston, and Ohio State University.

The 25 schools listed in Table 1 represented the source of 52.6 percent of the 22,677 U.S.-trained M.D. graduates with faculty appointments at any U.S. medical school.

Table 2 shows the distribution of schools by the fraction of their alumni who were faculty members at institutions other than their own. Harvard Medical School leads this ranking as well, with 16.0 percent of its active physician alumni serving on the full-time faculties of other medical schools. Johns Hopkins University School of Medicine, Yale University School of Medicine, and University of Chicago Pritzker School of Medicine also had large fractions of their alumni serving on the faculties of other medical schools. These four schools had an average of more than 15 percent of their alumni serving on another medical school's faculty. This compared with an average of 5.4 percent for the alumni of all U.S. medical schools.

The ranking of the 25 schools shown in Table 2 includes only 15 of the schools that were listed on Table 1. The 10 new schools are

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The work on which this datagram is based was supported in part by the National Institutes of Health under contract 1-OD-2121.

TABLE 1

Major Medical School Origins of U.S.-Trained Full-Time Physician Faculty Members at U.S. Medical Schools, December 1979

School of Graduation	No. with Appointments at School of Graduation	No. with Appointments at Other U.S. Medical Schools	Total with Faculty Appointments	Percent of Alumni on Faculty at School of Graduation
Harvard	266	1,024	1,290	20.6
Columbia	88	635	723	12.2
University of Pennsylvania	124	588	712	17.4
New York University	66	591	657	10.0
Johns Hopkins	82	552	634	12.9
University of Michigan	147	392	539	27.3
SUNY-Downstate	41	471	512	8.0
Minnesota-Minneapolis	178	319	497	35.8
Yale	44	446	490	9.0
Cornell	53	419	472	11.2
Chicago-Pritzker	56	393	449	12.5
Washington-St. Louis	81	359	440	18.4
Rochester	72	349	421	17.1
Northwestern	8	407	415	1.9
Case Western	74	340	414	17.9
Duke	91	302	393	23.2
Illinois	31	345	376	8.2
Jefferson	34	331	365	9.3
Ohio State	82	253	335	24.5
Temple	62	249	311	19.9
Tufts	73	238	311	23.5
Texas-Galveston	73	222	295	24.7
Tulane	38	254	292	13.0
University of Virginia	62	228	290	21.4
Indiana	97	189	286	33.9
Subtotal	2,023	9,896	11,919	17.0
All other U.S. Schools	3,063	7,695	10,758	28.5
Grand Total	5,086	17,591	22,677	22.4

Albert Einstein College of Medicine of Yeshiva University, Stanford University School of Medicine, Vanderbilt University School of Medicine, State University of New York (SUNY) Upstate Medical Center College of Medicine, Medical College of Pennsylvania, Boston University School of Medicine, University of Vermont College of Medicine, University of Florida College of Medicine, University of Wisconsin Medical School, and Bowman Gray School of Medicine of Wake Forest University.

It should be noted that although some schools had similar percentages of their alumni serving on faculties at other schools, the actual numbers of such alumni differed. For example, the Vanderbilt University School of Medicine had 7.7 percent of its alumni with faculty appointments at other schools, and the SUNY Downstate Medical Center College of Medicine had 7.6 percent. However, SUNY-Downstate had 471 out of 6,187 physician alumni serving on faculties at other medical schools, while Vanderbilt had 186 such physician alumni from

TABLE 2

Active Physician Alumni with Full-Time Faculty Appointments at U.S. Medical Schools Other than Graduating Institution, December 1979

School of Graduation	No. with Appointments at Other Schools	Active Physician Alumni	Percent of Alumni Serving on Other Faculties
Harvard	1,024	6,410	16.0
Johns Hopkins	552	3,653	15.1
Yale	446	2,998	14.9
Chicago-Pritzker	393	2,756	14.3
Rochester	349	2,793	12.5
Columbia	635	5,083	12.5
Cornell	419	3,591	11.7
New York University	591	5,894	10.0
University of Pennsylvania	588	5,883	10.0
Case Western	340	3,608	9.4
Duke	302	3,220	9.4
Einstein	207	2,350	8.8
Washington-St. Louis	359	4,156	8.6
Stanford	211	2,592	8.1
Vanderbilt	186	2,406	7.7
SUNY-Downstate	471	6,187	7.6
SUNY-Upstate	230	3,060	7.5
University of Virginia	228	3,129	7.3
Medical College of Pennsylvania	135	1,878	7.2
Boston	222	3,089	7.2
Vermont	132	1,993	6.6
Northwestern	407	6,152	6.6
Florida	80	1,256	6.4
University of Wisconsin	202	3,461	5.8
Bowman Gray	109	1,916	5.7
Subtotal	8,818	89,514	9.9
All other U.S. Schools	8,773	234,531	3.7
Grand Total	17,591	324,045	5.4

a total of 2,406 graduates.

The rankings of some schools may have been affected by slow reporting by the schools of new faculty appointments to the AAMC Faculty Roster System during the past several years. The weaknesses in reporting affect all the statistics to some degree, but they would particularly affect the rankings of those institutions which have reported incomplete information to the roster system.

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Career Destiny of 550 Americans Several Years After Graduating from a Foreign Medical School

Aims C. McGuinness, M.D., and Henry R. Mason

Abstract—A longitudinal study of 550 Americans who took the examination sponsored by the Educational Commission for Foreign Medical Graduates in February 1972 after or while attending a foreign medical school has been completed. Ten years following graduation from the foreign school, it was found that 70 members of the original group have never qualified for graduate medical education in the United States and an additional 61 have not become licensed practitioners.

Since its establishment in the late 1950s, the examination sponsored by the Educational Commission for Foreign Medical Graduates (ECFMG) and its predecessor has been used as the principal yardstick for determining whether a foreign medical graduate has achieved a level of medical education equal to that of an American graduate and, therefore, is qualified for graduate training in a U.S. hospital or training center. The examination is given twice a year in several cities throughout the world. There is no limit to the number of times a person may take it. Since 1970 a student has been permitted to take the examination upon completion of two years of study at a foreign medical school.

In February 1972, 550 (3.5 percent) of the 15,735 persons who took the ECFMG examination were American citizens at time of entry into medical school and had completed at least two years of college on the U.S. mainland. A total of 245 (44.5 percent) of these persons passed the examination as compared with a pass rate of 43.1 percent for all persons taking the same examination. Seven years and again almost 10 years following the February 1972 examination, each of the 550 names were fed into the American Medical Association (AMA) Physician Masterfile, but only 480 could be found. This indicated that 70 members of the original group had not succeeded in passing the ECFMG examination. (The masterfile contains biographical data for all living graduates of U.S. medical schools and graduates of foreign schools who have qualified for graduate medical education in the United States.)

Medical Schools Attended

The 550 U.S. citizens had attended 78 medical schools in 21 countries outside the United States and Canada. As shown in Table 1, only 14 medical schools in nine countries had five or more of these U.S. citizens. Medical schools in the Republic of Ireland, Israel, and the Netherlands each had six U.S. citizens, but no single school in these three countries had four or more. Only three medical schools, the Uni-

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Dr. McGuinness, now retired, was associate director of the Educational Commission for Foreign Medical Graduates. Mr. Mason, also retired, was research associate with the Council on Medical Education, American Medical Association, Chicago.

TABLE 1

Performance by U.S. Citizens Taking the ECFMG Examination February 1972, by Country of Medical School Attended and by Individual Medical Schools*

Country	Medical School	No. of Candidates	No. Passing
Austria	University of Vienna	6	3
	Others	6	3
Belgium	Catholic University of Louvain	25	10
	Others	8	2
France	Faculty of Medicine, Montpellier	15	8
	University of Paris	5	2
	Others	12	4
Germany	University of Heidelberg	12	4
	Others	15	3
Greece	National University of Athens	4	2
	Others	1	0
Ireland		6	5
Israel		6	3
Italy	University of Bologna	135	56
	University of Rome	15	6
	Others	13	4
Mexico	Autonomous University of Guadalajara	177	88
	National University Autonomous of Mexico	15	5
	University of Nuevo Leon	6	2
	Others	7	0
Netherlands		6	5
Philippines	University of Santo Tomas	7	3
	Others	1	1
Spain	University of Madrid	6	0
	University of Zaragoza	6	1
	Others	6	0
Switzerland	University of Lausanne	7	4
	Others	4	3
		532	227

* Only countries and medical schools having four or more candidates are individually identified.

versity of Bologna, the Autonomous University of Guadalajara, and the Catholic University of Louvain had 25 or more U.S. citizens. A total of 337 (61.3 percent) of the examinees were students or graduates of these latter three schools.

Year of Graduation

As shown in Table 2, 299 (54.4 percent) of the U.S. citizens examined were undergraduates, of whom 143 (47.8 percent) passed the examination. A total of 158 (28.7 percent) of the Americans were examined in the first two years following graduation, of whom 77 (48.7 percent) passed. Thus, 83.1 percent of the examinees were either undergraduates or in the first two years following graduation. The "year of graduation" was that given by the candidate on his application to take the ECFMG examination. U.S. citizens in Mexican medical schools usually give as the "year of graduation" the year in which they will finish, or have finished, the four- or five-year didactic course rather than the year in which they will receive, or have received, the Titulo de Medico Cirujano (equivalent to the M.D. degree).

TABLE 2

Performance of Americans on February 1972 ECFMG Examination by Year of Graduation from Foreign Medical School

Classification/ Year of Graduation	No. of Candidates	No. Passing	Percent Passing
Undergraduates			
1976	1	0	—
1975	0	0	—
1974	11	3	27.2
1973	38	23	60.5
1972	249	117	46.9
Graduates			
1971	118	60	50.8
1970	40	17	42.5
1965–1969	56	14	25.0
1964 and earlier	37	11	29.7
Total	550	245	44.5

Fifty-six (10.2 percent) of the 550 examinees were from the graduating classes of 1965–1969 and 37 (6.7 percent) from the classes of 1964 and earlier. Of the 37 from the classes of 1964 and earlier, 15 were licensed practitioners in Connecticut, New York, and Pennsylvania who were seeking ECFMG certification for admission to the licensure examination of another state. Eight of these 15 physicians (53 percent) passed the examination, even though the combined pass rate for all examinees from the classes of 1964 and earlier was only 29.7 percent.

Number of ECFMG Tests

Table 3 shows the performance of the 550 U.S. citizens on the February 1972 examination in relation to the number of ECFMG tests previously attempted by the same group. There was no significant difference in the performance of Americans taking the examination for the first, second, and third time. The overall pass rate for them was 46.6 percent. The pass rate for this subgroup stands out in sharp contrast to the pass rate for the 34 candidates repeating the examination between the seventh and 20th time. The combined pass rate for the latter subgroup was 23.5 percent. These contrasting pass rates between examinees who have attempted the ECFMG test a few times and examinees who have taken it more than six times have been consistently characteristic for the ECFMG test. An examinee who continues to fail after several attempts bears out the uniformity and validity of the test.

TABLE 3

Performance of Americans on February 1972 ECFMG Examination in Relation to Number of Tests Previously Taken

No. of Exams Taken	No. of Candidates	No. Who Passed	Percent Who Passed
1	253	117	46.2
2	138	63	45.7
3	62	31	50.0
4	37	14	37.8
5	15	7	46.7
6	11	5	45.5
7–10	23	6	26.1
11–20	11	2	18.2

10-Year Follow-Up

Of the original cohort of 550 Americans who took the February 1972 ECFMG test, 480 (87.3 percent) were found in the AMA Physician Masterfile in March 1979 and again in December 1981. This would indicate that the 70 who were not found still had not earned an ECFMG certificate, had not completed a "fifth pathway" graduate medical education program, and were not licensed physicians. (The fifth pathway program consists of a year of supervised clinical training under the supervision of a U. S. medical school faculty. It was initiated by the AMA in 1971 to compensate for the weak clerkships at certain Mexican medical schools and enabled Americans to bypass a year of internship and a year of social service in Mexico. Upon completion of the fifth pathway year, the student is eligible to enter an approved residency without having earned an ECFMG certificate.) A total of 419 of the 480 physicians found in the file were licensed to practice medicine in at least one state.

A total of 321 had eventually become ECFMG-certified, and by August 1980 108 had successfully completed a fifth pathway program. This indicates that 429 (78 percent) of the original cohort had reached the point of eligibility for graduate medical education. Of this latter group, 10 failed to achieve or did not seek medical licensure.

Board Certification

By December 1981, 134 (28 percent) of the original cohort found in the AMA masterfile were certified by a U.S. specialty board. This is a considerably smaller percentage than the 40 percent of all physicians achieving board certification (1). Forty of those certified earned the certificate of the Board of Family Practice. Fourteen of the group were certified by each of the specialty boards of internal medicine and pediatrics and 11 by each of the boards of obstetrics/gynecology and urology, respectively; nine had earned a U.S. specialty certificate in radiology; eight and seven held certificates in psychiatry and general surgery, respectively. An additional 20 physicians held certificates of 15 other specialty boards. The total number of certificates earned by members of the cohort as of 1981 was twice the number earned by the group as of March 1979.

TABLE 4

Major Professional Activity of U.S. Physicians Eight to 10 Years After Graduating from Foreign Medical Schools

Major Activity	When Surveyed	
	March 1979	December 1981
Office-based practice	205	287
Hospital-based practice	45	60
Residency training	67	14
Medical administration	2	8
Research	31	17
Medical teaching	1	3
Inactive	8	11
Unclassified or unknown	116	74
Deceased	5	6
Total	480	480

Major Activity

In March 1979 and December 1981, when the names of the 550 physicians in the original 1972 cohort were fed into the AMA computer, the records of 480 that were found revealed their major professional activity as shown in Table 4. On the earlier date, 205 physicians were engaged in office-based practice, but in December 1981 this figure had risen to 287. Sixty members of the cohort were full-time hospital physicians on the latter date; eight were engaged in medical administration and 17 in research, and 14 were registered as hospital residents. Seventy-four of the physicians were in an "unclassified" category; it may be presumed that a large percentage of these consist of unlicensed members of the original cohort.

Summary

A longitudinal study was made of 550 individuals who were U.S. citizens at the time of entry into a foreign medical school and who took the February 1972 ECFMG examination to qualify for further medical training in a U.S. hospital or medical school. Their composite performance on the examination has been reported, and the subsequent experience of the group in pursuing a medical career in the U.S. has been evaluated by feeding their names into the AMA Physician Masterfile about 10 years after the February 1972 ECFMG examination. The data reveal that three-quarters of the original cohort of 550 students have achieved active careers as physicians in the United States. Biographical data for 70 members of the original group were not in the masterfile, indicating a failure to qualify for U.S. graduate training. Of the 480 found in the masterfile, only 419 held a medical license in at least one state. It may be concluded from these data that about 25 percent of the Americans who attended foreign medical schools in the 1960s and 1970s have never qualified as U.S. physicians.

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DATAGRAM

Distribution of Women in U.S. Medical Schools, 1970-71 and 1980-81

The decade of the 1970s saw a significant increase in the number and proportion of women in U.S. medical schools that resulted in a more equal distribution of women students throughout all medical schools.

The increase in women students has been attributed to many factors, including the enactment of legislation for more equal opportunity in the educational setting and the growing perception by young women—and others—that professional careers are open to women. Another important factor was probably the overall expansion in the medical education capacity in this country that occurred simultaneously with these other changes. In effect, women students filled 65.1 percent of the new first-year positions created between 1970-71 and 1980-81 (Table 1).

The total number of women medical students increased from 3,639 (9.1 percent of total enrollment) in 1970-71 to 16,955 (26.2 percent) in 1980-81. The standard deviation for the

TABLE 1

New First-Year Entrants in U.S. Medical Schools

Year	Total Students	Women Students	Percent Women
1980-81	16,590	4,758	28.7
1970-71	11,169	1,228	11.0
Difference	5,421	3,530	65.1

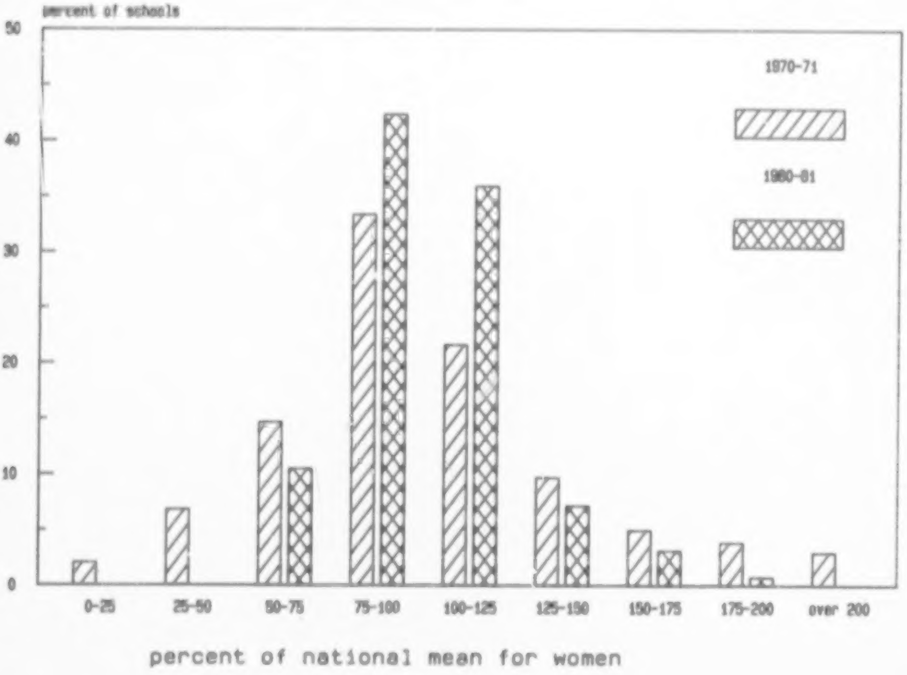

FIGURE 1

Women in U.S. medical schools as a percent of the national mean of women medical students, 1970-71 and 1980-81.

percent of women enrolled in each medical school in 1970–71 was 4.0 percent, nearly half the mean value. The 1980–81 standard deviation was 6.3 percent. This seems to indicate that the percentage of women in any medical school is becoming clustered around the mean. In 1980–81, 78 percent of all schools were within 25 percent of the mean, as compared with 55 percent in 1970–71 (Figure 1). (For the purpose of this analysis, the Medical College of Pennsylvania, formerly Woman's Medical College of Pennsylvania, has been excluded. Its high percentage of women enrollees—93.6 percent in 1970–71 and 58.6 percent in 1980–81—distorts rather than contributes to this analysis. Total enrollment of women including the Medical College of Pennsylvania was 9.9 percent in 1970–71 and 26.9 percent in 1980–81.)

Schools with a greater percentage of women in 1970–71 tended to increase the percentage at a lesser rate but still tended to have a greater percentage of women at the end of the 10-year period. While the increase in the percentage of women averaged 17.46 percent for all schools, it was slightly less for the top 50 schools (16.45 percent) and the top 25 schools (15.61 percent).

These data indicate that women students are more equally distributed throughout all U.S. medical schools than was the case a decade ago.

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Educational Origins of M.D. Faculty Members In Five Groups of Medical Schools

Charles R. Sherman, Ph.D., and Terry Bryll

Abstract—Five groups of medical schools are used to describe the relationship between the type of institution where a physician serves as a full-time faculty member and the type of institution where the M.D. degree was awarded. For each group of schools, percentage distributions are presented showing where the graduates now teach full time. The educational origins of all U.S.-trained full-time M.D. faculty members in each group are also shown in percentage distributions. These distributions are presented including and excluding individuals who are faculty members at the same schools where the M.D. was earned. Research schools are seen to contribute proportionally more of their graduates to U.S. faculties in all groups of schools. The group with proportionally more students oriented toward primary care specialties contributes faculty members largely to other schools in the same group. Research schools also evidence a similar "group inbreeding." All groups are net contributors to faculties at medical schools founded after the mid-1960s.

Numerous vacancies on faculties of clinical science departments continue to cause concern for the future supply of M.D.s to serve as teachers and researchers at U.S. medical schools (1, 2). Statistics are periodically published that list the major sources of U.S.-trained M.D.s on U.S. medical school faculties. In the most recent compilation (3), as in others (4, 5), 25 medical schools are listed as the leading sources of faculty members. A second ranking names 25 schools to be the principal sources of faculty members calculated as a proportion of their living graduates. Invariably the major research centers dominate both lists. A few additional schools with exceptionally large numbers of alumni also rank among the institutions producing the most faculty members for the American medical education system.

A study (6) conducted at the Association of American Medical Colleges (AAMC) compared medical schools on 17 variables indicating relative educational emphases on research and on primary care specialties. The analysis disclosed a pattern of four groups, or clusters, of like institutions. The generally acknowledged research centers comprised one of the groups. The less research-intensive schools divided themselves into three groups, varying principally in their preferred acceptance of students who, at least at the outset of their medical education, favored practice in pri-

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mary care specialties. Faculty members at these institutions may include proportionally more M.D.s whose skill lies in clinical care and teaching rather than in research. Where do these schools with different educational emphases get their faculties? Of their graduates, how many enter academic medicine, and where do they go to teach? In this paper the authors present some new statistics that address these questions.

Method

Aggregated data for five groups of medical schools are used to describe and compare the M.D. faculty of each group and the graduates of each group who become medical school faculty members. The principal data are derived from the AAMC Faculty Roster System, reconstructed to reflect the faculty positions held at all U.S. schools on January 1, 1980. These data are complemented by counts of active alumni of each school as of December 31, 1979, derived from the American Medical Association's Physician Masterfile.

The 22,677 faculty members described here were all full-time teachers who held an M.D. degree from a U.S. medical school. The educational origins of Ph.D.s on the faculties are not examined in this paper, even though many of them did graduate work in medical schools. Also excluded are 6,591 physician faculty members (22.5 percent of all full-time physician faculty members in the United States) who received their degrees outside the United States. Faculty members who were serving part-time are also excluded from the tabulations.

The classification of U.S. medical schools into five groups is based on the AAMC study (6) in which four clusters of schools were differentiated. The fifth group comprises the relatively "new" medical schools (founded after the mid-1960s), which were omitted from the previous classification on technical grounds. As the authors of the previous study acknowledged, their findings were not meant to imply that there are only four types of medical schools or that every school has been accurately and immutably classified. Thus to avoid misunderstanding, the groups are not assigned names, nor are their complete memberships listed here. The groupings are useful for the present purpose of describing a pattern in the sources of medical school faculties. The five groups are labeled "1," "2," "3," "4," and "new." Each of the first four groups is further identified by the name of the "most typical" school, reported in the AAMC study to be closest to the statistical "center" of each cluster. Generally, Group 1 schools matriculate proportionally more students with an interest in primary care specialties than do schools in Group 2, and Group 2 more so than Group 3. Group 4 is generally comprised of research-intensive academic medical centers.

Group 1 consists of 29 schools and is typified by the University of Nebraska College of Medicine. Group 2 consists of 24 schools and is typified by Georgetown University School of Medicine. Group 3 consists of 17 schools and is typified by Northwestern University Medical School. Group 4 has 14 schools and is typified by the University of Pennsylvania School of Medicine. The Southern Illinois University School of Medicine typifies the 42 schools in the fifth group. The data reported below describe each group and not the "typical" school named.

Results

Descriptive analyses are reported in five sections. First, the five groups are compared on their overall contribution of graduates to U.S. medical school faculties. The last four sections examine current faculties. Each faculty member is classified jointly by the group of schools where he earned an M.D. and the group of schools where he now serves on a faculty. The percentage distributions of where each group's graduates went to teach are compared in the second section. The percentage distributions of where each group's faculties earned their M.D.s are compared in the third section. After a comparison of rates of group "inbreeding," the fourth and fifth sections present revised distributions of graduates' careers and faculty origins.

Graduates on faculties—Table 1 presents the numbers and percentages of graduates from each group of schools who were serving on faculties of U.S. medical schools as of January 1, 1980. Graduates of Group 4 schools were twice as likely to become full-time medical school faculty members as were graduates of all schools. Relatively few of the graduates of the new schools were on faculties. This was due in part to insufficient elapsed time for their graduates to have advanced and filled faculty positions. It also may have been due in part to the less developed research component of newer schools compared with established schools.

The percentages presented in Table 1 are low estimates of each group's total contribution of graduates to the academic world. Nationally, about 5 percent of M.D. faculty members leave academic medicine each year (7). Thus, there were additional graduates of all groups who had served in academic medical settings prior to this study or who were serving outside the United States.

Locations of faculty positions—Table 2 presents the percentage distribution of where graduates of each group who were teaching held their current full-time appointment. For graduates of each of the five groups, an individual was most likely to become a teacher at the same medical school or at one that was similar to it. In Table 2 the largest percentages in all rows are the diagonal elements. Faculty members who were graduates of Group 1 and

TABLE 1

Number of Active Graduates from Five Groups of U.S. Medical Schools and Percentage Who Were Full-Time Faculty Members at Any U.S. Medical School, January 1, 1980

School Group*	Typical School in Group†	No. of Active Graduates from Group	No. of Graduates on Any Faculty	Percentage on a Faculty
1	University of Nebraska College of Medicine	97,045	5,060	5.2
2	Georgetown University School of Medicine	101,858	5,824	5.7
3	Northwestern University Medical School	60,417	4,212	7.0
4	University of Pennsylvania School of Medicine	53,525	7,321	13.7
New	Southern Illinois University School of Medicine	11,200	260	2.3
All U.S. Schools		324,045	22,677	7.0

* For explanation of groups, see text.

† Schools named typify schools in group. Data in this and subsequent tables describe entire groups.

TABLE 2

Percentage of M.D. Graduates Teaching Full Time Who Were Faculty Members at Each of Five Groups of U.S. Medical Schools

School Group of Graduation	No. of Graduates Teaching	Teaching Location of Graduates by School Group (in percentages)*				
		1	2	3	4	New
1	5,060	48.8	12.9	10.8	9.5	18.0
2	5,824	15.1	36.3	13.4	14.6	20.7
3	4,212	15.6	15.4	32.9	15.6	20.6
4	7,321	16.8	16.7	13.9	35.1	17.6
New	260	16.2	12.7	12.3	8.5	50.4
All U.S. Schools	22,677	23.3	20.6	16.6	20.2	19.4

* Rows may not sum to 100.0 percent due to rounding.

new schools were the most likely to hold their appointment at a school in their group of graduation.

Graduates teaching at schools somewhat dissimilar to their alma mater (that is, schools in other groups) are denoted by off-diagonal elements in the table. Graduates of all groups were more likely to be on faculties at the new schools than on faculties in any group of schools other than their own group. This effect is most striking for Group 1. A graduate of a school in Group 1 (primary care oriented) was twice as likely to join a faculty at a new school (18.0 percent) than at a research-intensive medical school, Group 4 (9.5 percent).

Sources of M.D. faculties—Table 3 gives a different perspective on the same data used to derive Table 2. Instead of describing graduates, however, the percentages describe the faculties. Each row is the percentage distribution of the educational origins (by groups of medical schools) of all full-time M.D. faculty members in the particular group of schools. For each group except the new schools, faculty members were most likely to have graduated from the school where they were teaching or from another school in the same group. The new schools derived only 3 percent of their faculty members from graduates of other new schools. This is not surprising, given the time required to complete specialty training before joining a faculty and given the fact that the new medical schools were not commonly research oriented.

From this perspective, faculty inbreeding appeared to be most extensive among Group 4 schools (56 percent of their faculty members graduated from Group 4 schools) and least extensive among Group 3 schools.

For each group except the new schools, Group 4 was the second most plentiful source of M.D. faculty members. This probably indicates that research was an activity of all medical schools and that faculty members hired to do research were drawn from physicians who chose or were exposed to an intensive research setting during medical school.

Group 4, the research schools, derived a smaller proportion (10.5 percent) of their faculty members from Group 1, the primary care schools, than did any of the other groups of schools (46.8, 13.9, 14.6, and 20.7 percent).

Faculty inbreeding within the school groups shown in tables 2 and 3 had two components: (*a*) faculty members who received the M.D. degree from the same school at which they were teaching and (*b*) faculty members who earned their M.D.

degrees at other schools within the same group of similar schools. Table 4 distinguishes faculty members from both types of sources for each of the five groups of medical schools. Group inbreeding percentages (column D) are the same percentages as the diagonal elements of Table 3. For each group it is equal to the sum of column B ("institutional inbreeding") and column C (percentage of faculty members who were graduates of other schools in the same group—referred to as "residual inbreeding"). For all groups except Group 4, the institutional inbreeding was about two-thirds of the total group inbreeding. For Group 4, less than half of the total inbreeding was due to individual schools' reclaiming their own graduates as faculty members. The revised patterns of graduates' faculty positions and of faculties' educational origins, after removing the effects of institutional inbreeding, are presented below.

Graduates on other faculties—The data in Table 5 exclude graduates who were teaching at the same school where they received their M.D. degree. The apparent tendency for graduates of schools in any group to become teachers at other schools in the same group (group inbreeding) is not universally true after the influence of institutional inbreeding is statistically removed. In the adjusted data in Table 5, it may be seen that graduates were more likely to be on faculties in the new schools than in any other group. This is under-

TABLE 3

Percentage of Full-Time Faculty Members Who Graduated from Each of Five Groups of U.S. Medical Schools

School Group	No. of M.D. Faculty Members	Source of M.D. Faculty by School Group of Graduation (in percentages)*				
		1	2	3	4	New
1	5,276	46.8	16.6	12.5	23.3	0.8
2	4,671	13.9	45.2	13.9	26.2	0.7
3	3,756	14.6	20.7	36.8	27.0	0.9
4	4,577	10.5	18.5	14.3	56.2	0.5
New	4,397	20.7	27.4	19.7	29.2	3.0
All U.S. Schools	22,677	23.3	25.7	18.6	32.3	1.1

* Rows may not sum to 100.0 percent due to rounding.

TABLE 4

Percentage of Full-Time U.S.-Trained M.D. Faculty Members Who Graduated from Schools in the Same Group in Which They Were Teaching

School Group	(A) No. of U.S.-Trained Full-Time Faculty Members	(B) Percentage of Faculty in (A) from the Same School	(C) Percentage of Faculty in (A) from Other Schools in the Same Group	(D) Percentage of Faculty in (A) from All Schools in the Same Group (B + C)
1	5,276	31.4	15.4	46.8
2	4,671	27.2	18.0	45.2
3	3,756	24.2	12.6	36.8
4	4,577	25.4	30.7	56.2
New	4,397	1.9	1.1	3.0
All U.S. Schools	22,677	22.4	15.8	38.2

TABLE 5

Percentage of M.D. Graduates Teaching Full Time at Other Than School of Graduation Who Were Faculty Members at Each of Five Groups of U.S. Medical Schools

School Group of Graduation	No. of Graduates Teaching at Other Than School of Graduation	Teaching Location of Graduates by School Group (in percentages)*				
		1	2	3	4	New
1	3,401	23.8	19.1	16.1	14.2	26.7
2	4,552	19.3	18.5	17.1	18.6	26.5
3	3,303	19.9	19.6	14.4	19.8	26.2
4	6,157	19.9	19.9	16.5	22.8	20.8
New	178	23.6	18.5	18.0	12.4	27.5
All U.S. Schools	17,591	20.6	19.3	16.2	19.4	24.5

* Rows may not sum to 100.0 percent due to rounding.

standable since senior-level faculty members in the new schools could only have come from schools of other groups.

After accounting for both institutional inbreeding and the supplying of faculty members for new medical schools, a tendency toward group inbreeding is seen only in Group 1 (primary care emphasis) schools and Group 4 (research emphasis) schools (23.8 percent and 22.8 percent, respectively). Group 2 graduates who were teaching were fairly uniformly distributed among the other three groups of schools (other than the new schools). Graduates of Group 3 schools (with comparatively neither a research nor a primary care emphasis) who were teaching seemed the least likely to teach at another Group 3 school (14.4 percent).

Outside sources of faculties—The figures in Table 6 do not include faculty members who received their M.D.s at the same school where they were teaching. A comparison of the percentages within each column indicates again that residual inbreeding among institutions occurred only in groups 1 and 4 schools. Both groups provided a greater percentage of their own faculties than they provided to other groups, even when institutional inbreeding was ignored. The opposite was true for Group 3 schools, as the four other groups of schools had a larger percentage of faculty members who were graduates of Group 3 schools than the Group 3 schools had. The inbreeding in Group 3 schools, therefore, was due mainly to institutional inbreeding, which was partially offset by the low-residual inbreeding of graduates among other schools in the group. Graduates of schools in Group 2 who served at other institutions had similar representation on the faculties of all groups. The inbreeding in Group 2 schools, while also due mainly to institutional inbreeding, was affected little by the residual inbreeding among Group 2 schools, as shown in Table 6.

While all groups exhibited significant overall inbreeding, only two groups, as stated above, exhibited residual inbreeding. Group 4 (research oriented) schools evidenced the strongest residual inbreeding (41.2 percent of the faculty members were graduates of other Group 4 schools) and the lowest level of utilization of Group 1 (primary care oriented) schools' graduates. Group 1 schools also showed a tend-

TABLE 6

Percentage of Non-Alumni Full-Time Faculty Members Who Graduated from Each of Five Groups of U.S. Medical Schools

School Group	No. of Non-Alumni M.D. Faculty Members	Source of M.D. Faculty by School Group of Graduation (in percentages)*				
		1	2	3	4	New
1	3,617	22.4	24.3	18.2	33.9	1.2
2	3,399	19.2	24.7	19.1	36.0	1.0
3	2,847	19.2	27.4	16.7	35.6	1.1
4	3,413	14.2	24.8	19.2	41.2	0.6
New	4,315	21.1	27.9	20.1	29.8	1.1
All U.S. Schools	17,591	19.3	25.9	18.8	35.0	1.0

* Rows may not sum to 100.0 percent due to rounding.

ency to hire the graduates of other schools in their group, while showing no preference for the graduates of Group 4 schools.

Discussion

The results show that five groups of U.S. medical schools drew their faculties from characteristically different patterns among the graduates of five groups of schools. Rate of institutional inbreeding (hiring their own graduates) does not completely account for the observed levels of group inbreeding. Thus, the groupings themselves, while prone to classification errors, do provide de facto evidence of diversity among institutions that may be related to their educational emphases or philosophies. The crossover of individuals between groups, however, demonstrates the compatibility of the different philosophies within the total U.S. medical education system.

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COMMUNICATIONS

In-State Experiences of Physicians Serving Rural Underserved Communities: The Case of Colorado

George E. Fryer, Jr., and Watson A. Bowes, Jr., M.D.

In Colorado inaccessibility of medical services is primarily a rural problem. Of Colorado's 63 counties, 36 have been federally designated, either fully or in part, primary care manpower shortage areas. None of the 21 fully designated counties lies in a standardized metropolitan statistical area (SMSA) nor contains a town of as many as 10,000 persons.

In the study reported here, the authors examined the association of birthplace, medical school, and site of residency training with location of practice. Special emphasis was placed on the rural underserved areas of the state.

Method

The Colorado Department of Health surveyed all physicians licensed to practice medicine in the state in December 1979. A respondent rate of 92.7 percent was attained. An analysis was performed by the authors on the data of the 4,089 allopathic practitioners who had completed their residencies and who completed the survey.

A rural-urban dichotomy predicated on population of county and its largest town was devised using 1980 census data. The 53 rural counties all contain populations of less than 30,000 and no single community of more than 13,000. The state's other 10 counties were classified urban, and all of them had a population of more than 80,000. The validity of this rural-versus-urban distinction had previously been documented (1).

Results and Discussion

Table 1 portrays the number and percentage of Colorado physicians who were born, attended medical school, and served a residency in the state. Residency training was clearly the dominant experience. Physicians practicing in sparsely settled areas, however, had more frequently attended the University of Colorado School of Medicine than taken residency in state (23.8 percent versus 18.6 percent). The percentage of rural physicians born in Colorado (17.9 percent) was about the same as those whose graduate medical training had taken place in state. A substantially greater percentage of physicians practicing in rural areas had been born and attended medical school in Colorado when compared with urban physicians. On the other hand, rural practitioners had served Colorado residencies much less often than urban physicians.

Among the 2,616 physicians practicing in the four largest of the Denver SMSA counties, 913 (34.9 percent) had taken their graduate medical education in the state. Only 559 (21.4 percent) had attended the University of Colorado School of Medicine in Denver. This indicates that physicians are inclined to practice in close proximity to the location of their residency but not to the medical school they attended.

Practice in a rural site was strongly associated with birth in the state (chi-square = 9.378, p value = .0022), modestly associated with undergraduate medical education in the state (chi-square = 1.695, p value = .1940), and inversely related to Colorado residency training (chi-

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This study was supported by Health Resources Administration contract 253-0026.

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TABLE 1

Location of Practice and Training of Colorado Physicians, 1979

Practice Location	Total	Born in Colorado		Graduated from Colorado School of Medicine		Had Residency Training in Colorado	
		No.	Percent	No.	Percent	No.	Percent
Rural county	365	65	17.9	87	23.8	68	18.6
Urban county	3,724	455	12.2	779	20.9	1,175	31.6
Total	4,089	520	12.7	866	21.2	1,243	30.4
Rural western county*	203	24	11.8	36	17.7	34	16.7
Rural eastern county*	67	20	29.9	31	46.3	22	32.8

* The western and eastern most rural regions comprise 36 of Colorado's 53 rural counties and are served by 270 of the state's 365 rural physicians.

square = 26.284, p value = .0000). These findings suggest that while availability of graduate medical educational opportunities has a favorable effect on this state's supply of physicians, it may contribute to their geographic maldistribution within Colorado.

The severity of medical underservice across rural Colorado varies geographically. This state's mineral rich and recreationally popular Western Slope is better served medically than the agriculturally dependent, rural counties of the Eastern Plains. Thirteen of the 16 eastern counties have been designated either totally or in part as medically underserved areas. Only five of the 20 rural western counties have been so designated. The physician-to-population ratio in the east is 1 to 2,053 compared with 1 to 1,022 for the western counties.

Table 1 compares the relationship between Colorado experiences and manpower within these two rural regions of the state. Each of the experiences was more frequently associated with physicians practicing in the underserved plains than on the Western Slope. On the Western Slope, 66.5 percent (135 of 203 physicians) had none of these experiences in Colorado while only 29.9 percent (20 of 67) of the Eastern Plains physicians had no previous Colorado experience. The differential between eastern (46.3 percent) and western (17.7 percent) county rural physicians having attended the University of Colorado School of Medicine was the most substantial among the three experiences.

Conclusion

A student's awareness of rural community need for medical service has been found to be a factor in his decision to establish rural practice (2). Benefits have been documented from the placement of medical students in rural areas for clinical experiences by the area health education center (AHEC) program of the University of Colorado Health Sciences Center (3). The findings in the study reported here suggest that individuals with previous experiences in the state are more sensitive to the needs of medically underserved Coloradoans than those with no previous experience here. Colorado residency training was more frequently related to medical practice in urban than in rural areas of the state. In-state birth and undergraduate medical education on the other hand were strongly associated with rural practice. These influences, particularly medical school attended, are especially significant in the more underserved rural areas.

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DATAGRAM

Net Patient Revenue at University-Owned Teaching Hospitals

Since 1971 the Department of Teaching Hospitals of the Association of American Medical Colleges (AAMC) has conducted an annual survey of financial and general operating data for the university-owned members of the AAMC's Council of Teaching Hospitals (COTH). Of the 63 hospitals sent questionnaires in April 1981 requesting information on their fiscal 1980 operations, 62 hospitals responded. To provide compatibility with data from previous survey years, nearly all the questions asked a year ago were retained. Data pertaining to operating income are reported on an accrual basis.

Net Patient Revenue

For the first time, net patient revenue has been accurately identified by source of revenue for a majority of the responding hospitals. In past years, the data received made it extremely difficult, and in many instances impossible, to distinguish between gross and net patient revenue figures. The current analysis, however, reports aggregate dollar and percentage totals for fiscal 1980 in terms of net patient revenue.

The capability to differentiate net from gross patient revenue by source will vastly improve the accuracy and comparability of future survey results. For the current survey year, however, this progress actually limits meaningful comparisons with revenue data from previous years, since the level of sophistication in patient revenue data collection varies greatly from hospital to hospital and only 60 percent of the current respondents were able to report net patient revenue by source.

Hospitals with State Appropriations

As in fiscal 1979, 44 (nearly 71 percent) of the respondents reported receipt of state appropriations in fiscal 1980. Not surprisingly, 41 of these hospitals were publicly owned. The distribution of state-funded hospitals by proportion of total operating revenue received from state appropriations from fiscal 1970 to fiscal 1980 is shown in Table 1. Since fiscal 1979, two hospitals were added to the group for which state appropriations accounted for less than 20 percent of total operating revenues.

A total of $493.1 million was appropriated by the states to the 44 state-assisted hospitals in fiscal 1980, only about $10 million more than in the previous fiscal year. As shown in Table 2, $288.5 million of this total went to the 25 state-assisted hospitals that were able to report net patient revenue by source. For these institutions, state appropriations represented 17.8 percent of their aggregate net patient revenue and was the second leading source of such revenue behind Medicare (23.5 percent). Commercial insurance was third at 17.2 percent.

The absolute dollar amounts of individual state appropriations in fiscal 1980 ranged from $686,000 to $45.5 million. The mean state appropriations among the 44 recipients of state funds was $11.2 million in fiscal 1980, up slightly from the $11.0-million average in fiscal 1979. The mean total net patient revenue figure for the 25 state-assisted hospital's able to report such revenue information was $64.8 million in fiscal 1980.

TABLE 1

Distribution of State-Funded Teaching Hospitals by Proportion of Total Operating Revenue Received from State Appropriations, 1970 Through 1980*

Fiscal Year	Percentage Total Operating Revenue from State Appropriations			
	1–20 Percent	21–40 Percent	41–60 Percent	61–100 Percent
1980 (*n* = 44)	28	12	4	0
1979 (*n* = 44)	26	13	5	0
1978 (*n* = 41)	25	13	3	0
1977 (*n* = 41)	25	13	2	1
1976 (*n* = 40)	24	13	3	0
1975 (*n* = 38)	19	13	6	0
1974 (*n* = 30)	13	12	5	0
1973 (*n* = 28)	13	9	6	0
1972 (*n* = 34)	12	12	9	1
1971 (*n* = 34)	11	15	5	3
1970 (*n* = 30)	12	8	10	0

* Reported on a cash basis from fiscal 1970 to 1973 and on an accrual basis thereafter

Hospitals Without State Funds

Eighteen of the 62 hospitals in the survey sample received no state appropriations in fiscal 1980. Of these, 12 were able to submit net patient revenue data by source. This information is displayed in Table 3. As in the case of their state-assisted counterparts, these dozen institutions received the largest portion of their total net patient revenue (30.6 percent) from Medicare, Blue Cross (24.1 percent) and com-

TABLE 2

Sources of Operating Revenue for University-Owned Teaching Hospitals That Received State Appropriations

(In thousands of dollars)

Revenue Source	Net Patient Revenue, Fiscal 1980 ($n = 25$)		Total Operating Revenue, Fiscal 1979 ($n = 44$)		Total Operating Revenue, Fiscal 1978 ($n = 41$)	
	Amount	Percent	Amount	Percent	Amount	Percent
State appropriations*	288,501	17.8	483,632	17.1	412,179	17.6
Blue Cross	245,177	15.1	385,429	13.6	308,761	13.2
Commercial insurance	278,958	17.2	470,284	16.7	396,610	17.0
Self-pay	114,208	7.1	176,854	6.3	180,467	7.7
Medicare	380,481	23.5	611,283	21.7	487,256	20.9
Medicaid	211,916	13.1	427,423	15.2	347,417	14.9
County appropriations	15,657	1.0	25,399	.9	19,465	.8
City appropriations	0	0	4,175	.1	6,928	.3
Additional welfare payments	33,601	2.1	20,161	.7	27,250	1.2
Workman's compensation	6,861	.4	†		†	
Other	43,497	2.7	215,783	7.7	149,656	6.4
Total	1,618,857	100.0	2,820,423	100.0	2,335,989	100.0

* Includes some appropriations earmarked for non-patient care use.

† Included in "Other" category.

TABLE 3

Sources of Operating Revenue for University-Owned Teaching Hospitals That Did Not Receive State Appropriations

(In thousands of dollars)

Revenue Source	Net Patient Revenue, Fiscal 1980 ($n = 12$)		Total Operating Revenue, Fiscal 1979 ($n = 19$)		Total Operating Revenue, Fiscal 1978 ($n = 22$)	
	Amount	Percent	Amount	Percent	Amount	Percent
Blue Cross	211,213	24.1	297,380	18.9	329,509	21.2
Commercial insurance	149,051	17.0	232,864	14.8	261,081	16.8
Self-pay	81,355	9.3	189,388	12.1	190,654	12.3
Medicare	267,820	30.6	424,820	27.0	401,744	25.9
Medicaid	73,363	8.4	270,534	17.2	268,464	17.3
County appropriations	510	<.1	557	<.1	507	<.1
City appropriations	0	0	222	<.1	131	<.1
Additional welfare payments	6,778	.8	7,556	.5	10,457	.7
Workman's compensation	3,672	.4	*		*	
Other	81,820	9.3	147,441	9.4	87,801	5.6
Total	875,582	100.0	1,570,762	100.0	1,550,348	100.0

* Included in "Other" category.

TABLE 4

Sources of Operating Revenue by Type of Care in University-Owned Teaching Hospitals*

(In thousands of dollars)

Income Source	Net Patient Revenue, Fiscal 1980 ($n = 35$)				Total Operating Revenue, Fiscal 1979 ($n = 58$)			
	Outpatient		Inpatient		Outpatient		Inpatient	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Blue Cross	39,097	13.2	409,331	20.9	54,593	10.6	621,168	19.2
Commercial insurance	38,729	13.1	372,070	19.0	74,088	14.4	587,156	18.1
Self-pay	61,062	20.6	131,430	6.7	116,769	22.8	243,268	7.5
Medicare	51,195	17.3	577,368	29.5	91,562	17.9	929,361	28.7
Medicaid	36,897	12.5	236,274	12.1	95,942	18.7	581,359	17.9
State appropriations	42,094	14.2	70,923	3.6	24,072	4.7	67,151	2.1
County appropriations	4,315	1.5	11,852	.6	1,395	.3	5,159	.2
City appropriations	0	0	0	0	3,300	.6	160	<.1
Additional welfare payments	4,715	1.6	34,800	1.8	3,168	.6	23,009	.7
Workman's compensation	1,580	.5	8,869	.5	†		†	
Other	16,308	5.5	104,430	5.3	47,993	9.4	181,834	5.6
Total	295,992	100.0	1,957,347	100.0	512,882	100.0	3,239,625	100.0

* Data reported only for those hospitals able to separate revenue into inpatient and outpatient categories.

† Included in "Other" category.

mercial insurance (17.0 percent) were the next leading sources. The average total net patient revenue was $73.0 million in fiscal 1980.

Medicare, Blue Cross, and the "other" patient revenue category each had a higher percentage of total net patient revenue among the non-state-assisted hospitals than institutions that received state appropriations. On the average, Medicaid contributed significantly less to hospitals without state funding.

Sources of Revenue by Type of Care

Data on revenue sources from those respondents able to separate net patient revenue into inpatient and outpatient categories in fiscal 1980 are presented in Table 4. The number of such institutions totaled 35. For outpatient services, self-pay patients provided the leading source (20.6 percent) of net patient revenue. Medicare (17.3 percent) and state appropriations (14.2 percent) were the next highest sources. On average, outpatient net patient revenue per institution totaled $8.5 million in fiscal 1980.

For inpatient services, Medicare was by far the leading source (29.5 percent) of total net patient revenue in fiscal 1980. Blue Cross (20.9 percent) and commercial insurance (19.0 percent) were the next leading sources. In contrast to the high outpatient percentages for self-pay patients and state appropriations, these sources contributed significantly less (6.7 percent and 3.6 percent respectively) as portions of total inpatient net patient revenue. The mean total inpatient net patient revenue figure among these hospitals in fiscal 1980 was $55.9 million.

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Despite these figures, other evidence suggests the narrowing in the nation's resource pool as libraries struggle with declining budgetary growth rates and increasing inflation. The number of serial titles published continues to expand, yet the total number of current serial titles in the nation's health sciences libraries in 1979 was 6,000 titles less than it was in 1973 (122). From 1980 to 1981 the average number of serial titles held by AHSC libraries increased by only one percent, yet the average serials budget increased by 15 percent and is now close to consuming a quarter of the library's total budget. Every two years since 1976 the average medical school library budget has increased by 22 percent, barely keeping pace with inflation. The overall view is less favorable. Total support for medical school libraries in 1976 was 3.11 percent of total medical school operating expenses. Since then this support has steadily declined while medical school operating budgets have increased (Table 3).

If budgets for purchase of materials are not to increase to take up the shortfall that is developing, money must be allocated to develop strategies that optimize the organized purchase and sharing of resources between institutions. An AAHSLD survey in 1981 found AHSC library directors giving top priority in the next two to four years to automation and collection development, in that order. The curatorial responsibilities of the AHSC libraries are still in need of attention.

EDUCATION

Over the past 10 years the National Library of Medicine through the MLAA programs sponsored many efforts to adapt new technologies to health sciences education and to foster interinstitutional sharing of instructional resources through such network systems as the Health Education Network for computer-aided instructional materials. The emphasis has been on developing learning resources centers for the use of audiovisual materials, models, and patient simulation programs.

A creditable record has also been achieved in library educational programs. Of the 97 health sciences libraries responding to the 1981 AAHSLD survey, 22.9 percent had established written educational program goals, and 26.3 percent had written educational objectives to guide their programs; 10 (10.3 percent) schools offered formal courses for credit, while 24 (24.7 percent) offered elective courses in the medical school. The courses emphasize library research skills and knowledge of standard reference works, indexing and abstracting tools, and data bases. More than one-third of these courses were being

TABLE 3

Total Support for Health Sciences Libraries in United States

Fiscal Year	Medical Schools' Operating Budgets* (In millions)	Percent Change	Health Sciences Libraries' Expenditures† (In millions)	Percent Change	Percent Library Support‡
1975	1,519		47		
1976	1,800	18.5	56	19.2	3.11
1977	2,197	22.1	66	17.9	3.00
1978	2,451	11.6	68	3.0	2.77
1979	2,828	15.4	77	13.2	2.72
1980	3,316	17.3	75	−2.6	2.26

* Data from the AAMC Institutional Profile System.

† Data compiled by the University of Texas Health Science Center at Dallas, 1975–1977 (15–17), and the Association of Academic Health Sciences Library Directors, 1978–1981 (12–14).

‡ *J.A.M.A.* education issues from 1979 to 1981 (Table 26) gave figures nearly a percentage point lower: 1978 = 1.89, 1979 = 1.76, 1980 = 1.71. Those data were from 112 medical schools in 1978 and 1979 and 119 medicals schools in 1980.